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## EXPLORING THE INCREDIBLE 5-POINT SCALE: IMPACT ON TARGET BEHAVIORS IN PRESCHOOL

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EXPLORING THE INCREDIBLE 5-POINT SCALE: IMPACT ON TARGET

BEHAVIORS IN PRESCHOOL

BY

BETH MCBRIDE PINHEIRO

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE

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DOCTOR OF PHILOSOPHY DISSERTATION

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## **ABSTRACT**

In the following experimental study, a multiple-probe, single subject design (SSD) was used to evaluate the effectiveness of the Incredible 5-Point Scale (Buron & Curtis, 2012) as an intervention tool for a preschool aged child with developmental delays (DD). The scale, originally designed for individuals with Autism Spectrum Disorder (ASD) but found through noted experiences to have positive effects for individuals with other disabilities as well, is a teaching tool that aids teachers, therapists, and families in encouraging positive social and behavioral development in individuals (Buron & Curtis, 2012). While not an identified evidence-based practice (EBP) itself, the Incredible 5-Point Scale does utilize many EBP in its implementation and development. Therefore, the purpose of this study was to determine the effectiveness of the scale in modifying the target behavior of a four-year-old male with DD by using visual analysis, percentage of nonoverlapping data points (PND), and percentage of data exceeding the median (PEM) to indicate whether or not the scale was effective. After the implementation of the intervention, the participant's target behavior (inappropriate play with peers) decreased between baseline and intervention phases across all three activities. Practice and research implications as well as study limitations are discussed.

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## CHAPTER I. INTRODUCTION

### The Use of Evidence-Based Practices and Interventions in Early Childhood Settings

Since the signing of the No Child Left Behind Act (NCLB) in 2001 there has been a strong emphasis on the use of evidence-based practices (EBP) in schools. Eighteen years later, researchers continue to collaborate with teachers in order to add to the literature and provide evidence for teaching techniques and interventions to be used in the classroom for children with and without disabilities. One specific intervention designed as a tool to modify target behavior and teach social competence is *The Incredible 5-Point Scale* (Buron & Curtis, 2012; see Figure 1).

Figure 1. The Incredible 5-Point Scale

5	I am yelling and this is too loud.	
4	I am using an outside voice.	
3	I am using my normal talking voice.	
2	I am whispering or using a quiet voice.	
1	I am not talking.	

Figure 1. Sample of The Incredible 5-Point Scale for voice volume. Pictures by Beth and Thiago Pinheiro.

Originally the scale was developed to aid in modifying target behaviors of children with Autism Spectrum Disorder (ASD). However, as the developers of the scale implemented it, they found that the scale also worked for children with other disabilities. The Incredible 5-Point Scale utilizes EBP such as social stories, direct instruction, behavioral rehearsal, prompting, and/or video modeling (Antony & Roemer, 2011; Buron & Curtis, 2012; Wong et al., 2015) as the tool is taught and implemented. The works published on the scale are limited to how the scale is implemented and examples of the scale's implementation across a variety of settings with children from early childhood through high school. Moreover, to date there have been no empirical studies published on the scale, limiting the tool's acceptance as an EBP, despite its use of other, known EBP during both the development and implementation of the scale. Therefore, the purpose of this single-subject, multiple-probe design study was to explore the extent of the effectiveness of the Incredible 5-Point Scale as it relates to addressing target behaviors in preschool children with Developmental Delays (DD).

### **Selection of the Problem**

One of the primary responsibilities of preschool teachers is to facilitate the development of social and emotional skills within a group of young children who have a wide range of developmental strengths and needs (Exforsys, 2006). This includes children that may have never been to school before, have disabilities, have unidentified disabilities, or are still naturally developing self-regulation and behavior skills (Dodge et al., 2008).

According to the National Center for Education Statistics (NCES; 2019), the number of preschool aged children in the United States attending full day preschool

programs jumped from 40% in the year 2000 to 56% in 2017 (NCES, 2019).

Additionally, according to the National Institute for Early Education Research (NIEER; 2019) during the 2016-2017 school year, 1,540,309 preschool children ages 3 and 4 received educational services in state funded preschool programs nationwide, an increase of 3.5% from the 2015-2016 school year (NIEER, 2019. Data was not reported on 5-year-old children in programs). Of those students, 451,274 preschoolers ages 3 and 4 were receiving special education services (NIEER, 2019) compared to 440,931 preschoolers receiving special education services during the 2015-2016 school year, an increase of 2.3% (Barnett et al., 2017).

Preschool aged children with and without disabilities are developing at different rates, therefore, in order to meet the wide range of student abilities teachers frequently implement behavior management techniques in their classrooms (Aspy & Grossman, 2007, Buron, & Curtis, 2012). This includes techniques that have been thoroughly researched, vetted, and used on a wide scale such as video-modeling and prompting as well as trying new behavior management tools and techniques such as the Incredible 5-Point Scale, that have not gone through the rigor of multiple research studies. Moreover, current legislation (Individuals with Disabilities Education Improvement Act [IDEIA; 2004] and the Every Student Succeeds Act [ESSA; 2015]) continue to require the use of EBP in classrooms.

Each study utilized to provide evidence for an intervention as an EBP must meet rigorous guidelines to ensure that data is valid and reliable in order to provide support for the effectiveness of the intervention (IDEA'04 Research in Inclusive Settings [IRIS] Center, 2018). Many professional organizations such as the Council for Exceptional



Children (CEC) set forth specific quality indicators for the rigor of studies to determine whether or not they qualify as a study to support the literature on the specific practice or intervention (CEC, 2014). The CEC has further developed specific guidelines that are used to determine whether an intervention meets the threshold of the number of quality studies to determine whether or not it can be considered an EBP (CEC, 2014).

Through the use of task analysis, the Incredible 5-Point Scale is a tool designed to be utilized by teachers, parents, and other professionals to address issues of social competence. The scale is developed by determining a target behavior and breaking it into five points (or tasks) in order to modify the identified target behaviors (Buron & Curtis, 2012; Coffin & Smith, 2009). Although the Incredible 5-Point Scale includes evidence-based techniques the scale itself has not been documented in published, empirical studies nor has it been accepted as an EBP. Therefore, per current educational policies (IDEIA [2004] and ESSA [2015]), the Incredible 5-Point Scale cannot be utilized as an official EBP listed on students' individualized education programs (IEP). The intent of the present study is to contribute evidence to begin to enable stakeholders to determine their confidence in the Incredible 5-Point Scale as an EBP.

### **Statement of the Purpose of the Study**

The purpose of this single-subject, multiple-probe design study was to explore the extent of the effectiveness of the Incredible 5-Point Scale as it relates to addressing target behaviors in preschool children with Developmental Delays (DD). With the current emphasis on EBP another study purpose is to begin the empirical study of this tool.

### **Research Question**

The research question guiding this study is: *To what extent does the implementation of the Incredible 5-Point Scale impact target behaviors of preschool children with Developmental Delays?*

### **Definitions of Important Terms and Concepts**

*Developmental Delay:* This term, in the state of [masked], is a disability category for children between the ages of 3 and 8 years old. For the purpose of the study, developmental delay was used to refer to any person who met the diagnostic criteria for the state of [masked]. The [masked] Department of Education, (n.d.) identifies the eligibility requirement for developmental delay as a:

twenty-five percent (25 percent) delay and/or score equal to or greater than two standard deviations below the mean in one of these areas of development listed below; or a score equal to or greater than 1.5 standard deviation below the mean in two or more of the following areas: physical development, cognitive development, communication development, social or emotional development, and/or adaptive development. (p.6).

*Evidence-Based Practices:* This term refers to teaching techniques or strategies that have a significant body of research supporting the efficacy of their use (IRIS Center, 2018).

*Preschool Aged Children:* This term relates to young children and is determined by their ages, three to five years old (Dodge, Colker, and Heroman, 2008).

*Social Competence in Preschoolers:* This term is defined as the “condition of possessing the social, emotional, and intellectual skills and behaviors needed to succeed as a member of society” (Encyclopedia of Children’s Health, 2018, para. 1).

*Target Behavior:* This term is defined as a behavior that required intervention and was identified by the participant's teacher (IRIS Center, 2018; Turner, 2017).

## **Dissertation Organization**

The present study is delineated in five chapters, a references section, and appendices. The chapters are presented as follows: Chapter One provides background, the problem statement and significance of the study, the purpose statement and research question, and definitions of important terms and concepts. In Chapter Two a literature review provides readers with information regarding the theoretical and conceptual frameworks, EBP, behavior development of preschool aged children and EBP, DD, the Incredible 5-Point Scale, and multiple-probe SSD. Chapter Three presents the methodology including the research design, participants, setting, procedures, and data analysis. In Chapter Four, the results are presented. Chapter Five provides the summary, discussion, limitations, implications for stakeholders, and recommendations for future research. The dissertation concludes with the references section and appendices.

## **Chapter Summary**

Chapter One laid the foundation for what the reader should expect throughout the dissertation. Strong emphasis will be put on EBP and the development of children with and without DD and ASD. In Chapter Two, the literature review, the researcher will make a link between typical preschool development and the development of young children with ASD and DD in order to provide a rationale for the decisions made regarding the selection of the instrument and theoretical and conceptual frameworks guiding this study.

## **Chapter II. LITERATURE REVIEW**

### **Introduction**

What follows are the theoretical and conceptual frameworks that drive the study and elements that attribute to the behaviors of preschool- aged children with and without disabilities. Also included will be discussion surrounding current behavior interventions used in preschool classrooms that are relevant to the Incredible 5-Point Scale, information regarding the scale, and a description of SSD research and its importance to determining EBP.

### **Theoretical Framework**

In the Special Education field, several theories have been developed to help understand the behaviors of individuals from different disability categories. Unfortunately, many of these theories approach disability from a deficit model of thinking. For example, the Child Saving (CS) Theory was devised under the premise that children with disabilities needed to receive therapy in order to participate in society and lead normal lives. From this theory, the concept of moral therapy was introduced to the field of special education. Due to the delivery method of moral therapy the development and increased use of institutions for individuals with disabilities was encouraged.

According to Trent, Artiles, and Englert (1998), there is evidence of practices surrounding CS as far back as the early 1800's into the early 1970's. Trent et al. mention several theories regarding disability (psychological process model, cognitive strategy model, and the behavioral model; p. 283). In their argument against these models Trent et al. state that they were deficit models designed to focus on the etiology and symptoms of

the disabilities, rather than focusing on the strengths individuals with disabilities have (Trent et al., 1998).

As the present study was developed and the linkages between the typical development of preschool-aged children and the common characteristics of individuals with ASD became clearer, the researcher began to consider theories specific to individuals with ASD. Multiple explanatory theories regarding individuals with ASD exist today. Unfortunately, many of the theories (mind-blindness theory/theory of mind developed by Baron-Cohen in 1999, executive dysfunction theory developed by Pennington & Ozonoff in 1996, and weak central coherence theory developed by Frith in 1989 to name a few [Baron-Cohen, 2009]) like the original disability theories, utilize a deficit model approach to explaining the behaviors of individuals with ASD. The following is a review of several theories that were considered for the theoretical framework of this study.

The first theory that will be discussed is the Weak Central Coherence (WCC) Theory. Frith (1989) postulated that central coherence is one's ability to understand the big picture of the world around them; individuals with weak central coherence have a difficult time understanding the larger schema surrounding them and tend to focus on one aspect of the whole (Frith, 1989; Interactive Autism Network, n.d.). Preschool aged children are in the preoperational stage of Piaget's theory of cognitive development. Like individuals with WCC, preschoolers in the preoperational stage focus on the small parts of the big picture or one thing at a time in order to navigate the world around them (Dodge et al., 2008).

Similar to Piaget's preoperational stage of cognitive development, the context of WCC is that individuals with ASD have great attention to detail (Baron-Cohen, 2009). While Baron-Cohen views this attention to detail as a strength in individuals with ASD he states that according to supporters of WCC, individuals with ASD are seen as being "forever lost in the detail..." (Baron-Cohen, 2009, p.74) while never achieving "...an understanding of the system as a whole" (Baron-Cohen, 2009, p. 74). This deficit model of thinking limits the development of interventions and practices for children with ASD and emphasizes what they are unable to do rather than focusing on any strengths that may provide insight to appropriate ways of providing services and supports to children with ASD. Therefore, WCC was not selected as the theoretical framework for this study.

The second theory, Executive Dysfunction (ED), stresses the lack of executive functioning skills individuals with ASD present. Executive function (EF) is defined by Rao, Mysore, and Raman (2016) as "an umbrella term for functions such as planning, working memory, impulse control, inhibition and shifting sets, as well as the initiation and monitoring of action" (p. 171). Cooper-Kahn and Dietzel (n.d.) similarly define EF as "a set of processes that all have to do with managing oneself and one's resources in order to achieve a goal. It is an umbrella term for the neurologically-based skills involving mental control and self-regulation" (Cooper-Kahn & Dietzel, n.d., A formal definition of executive functioning, para. 1).

According to the work of the Center for Development of the Child at Harvard University, EF is necessary for controlling behaviors, remembering information, and focusing (as cited in Jackman et al., 2015). Due to the pervasiveness of behaviors such as decreased ability to plan and organize, self-regulation, and working memory in

individuals with ASD, some researchers believe that ED is a primary feature of ASD (Kriete & Noelle, 2015; Wong, 2004), and there is a common belief between some theorists that abnormalities of the prefrontal cortex may be the cause of some prevalent behaviors attributed to EF in individuals with ASD (Kriete & Noelle, 2015; Wong, 2004).

Authors identify three specific areas of executive functioning; 1) attention control, 2) goal setting, and 3) cognitive flexibility (Dichter et al., 2010; Kriete & Noelle, 2015; Rao et al., 2016; Wong, 2004). Attention control is one's ability to sustain attention and to selectively focus attention on an individual or situation. Cognitive flexibility considers an individual's working memory and the ability to self-regulate as well as shift attention and focus or the ability to transfer concepts from one context to another. Goal setting is the ability to plan and organize ideas, actions, and behaviors (Rao et al., 2016, p. 171).

According to the developmental continuum for preschoolers as presented by Dodge et al. (2008), there is significant evidence of the development of EF in preschool aged children. During preschool, young children are developing the ability to sustain attention to tasks for longer periods of time and show flexibility and persistence in activities and tasks. Additionally, there is a developmental focus on self-regulation skills (Dodge et al., 2008). Rao et al. (2016) note that "impairments in EF abilities have been widely reported in children with autism and appear to account for many of the features including the varied adaptive behaviour profile and restricted, repetitive behaviours" (p. 175). While ED theory aims to explain why individuals with ASD tend to persevere on specific behaviors or a lack of working memory, it does not encompass the strengths of individuals with ASD and is narrowly focused, therefore, ED theory was not selected as the theoretical framework for this study.

The third theory that will be discussed is Mindblindness Theory. Mindblindness Theory was developed by Baron-Cohen in 1990 and is based on the premise that individuals with ASD lack or have an impaired Theory of Mind (ToM; Baron-Cohen, 2009). According to Smuckler (2005), ToM is “a person’s awareness and understanding that he or she, and other people, have thoughts, beliefs, desires, intentions, feelings- the full range of mental states” (p. 12). This aligns with Piaget’s preoperational phase in that children in the preschool years are very egocentric. They have difficulty seeing things from the point of view of others. This is a skill that develops as children mature (Dodge et al., 2008). Similarly, mindblindness operates on the notion that individuals with ASD “lack this awareness and understanding and, therefore, cannot “mindread,” or easily and automatically interpret the mental states of others, a talent that is presumed to come naturally to non-autistic people” (Smuckler, 2005, p. 12). Baron-Cohen (2009) conceptualizes ToM as being delayed in individuals with ASD and limiting an individual’s ability to interact appropriately in social situations because he/she does not understand the nuances of others’ behaviors.

Mindblindness Theory is beneficial because it considers the individuals social aptitude separately from his or her IQ and it provides one explanation as to why individuals with ASD have delayed social development (Baron-Cohen. 2009). However, the theory does not explain nuances such as obsessions and while it does explain the difficulty individuals with ASD have in understanding and making sense of social situations and behaviors it does not address other areas of empathy, specifically regarding emotional responses to others (Baron-Cohen, 2009). Furthermore, in a review of the literature, Wong (2004) discussed that research generally shows an improvement in both



ToM and EF specific to inhibitory control in children with ASD between the ages of three to five (Wong, 2004). While Mindblindness and ToM are able to explain some behavioral characteristics of individuals with ASD, important concepts such as the need for consistency and rules are missing within the theory as it relates to preschool-aged children and individuals with ASD or DD. ToM looks at ASD through a deficit lens, therefore, it was not selected as the theoretical framework for this study.

The fourth and final theory that will be discussed is the Empathizing-Systemizing theory ([ES]; Baron-Cohen, 2009). ES theory evolved from Baron-Cohen's Mind-Blindness Theory. Moreover, while ES theory takes into consideration the ideas of ToM and mind-blindness, it adds an additional layer through the systemizing strength of individuals with ASD.

Baron-Cohen (2009) defines systemizing as the “drive to analyze or construct systems” (p. 71) and it requires the development of rules for specific systems within the individual's life; this could be behaviors, events, environments, or experiences. He provides thirteen separate areas where individuals with ASD tend to systemize, 1) sensory, 2) motoric, 3) collectible, 4) numerical, 5) motion, 6) spatial, 7) environmental, 8) social, 9) natural, 10) mechanical, 11) vocal/auditory/verbal, 12) action sequences, and 13) musical (Baron-Cohen, 2009). Sensory systemizing is evident in behaviors such as water play or food preference. Motoric systemizing includes behaviors like bouncing or flapping. Collectible systemizing is when the individual collects things such as baseball cards. Numerical systemizing are specific obsessions with numbers such as phone numbers or flight schedules. Motion systemizing is evident when the individual is fixated on watching a dryer spin and tumble the clothes over and over. Spatial

systemizing can be seen in obsessions with specific routes for travel or even in artwork. Environmental systemizing is observed when an individual with ASD lines toys such as trains or cars up in a straight line. Social systemizing is evident through conversations with an individual with ASD. He or she may begin to say something and expect the other person to finish the thought. Natural systemizing is when an individual with ASD has a strong affinity for nature and obsesses over learning and knowing about specific topics within nature, dinosaurs for example. Mechanical systemizing can be seen when individuals with ASD obsess over taking apart and putting together things like toy cars. Vocal/auditory/ verbal systemizing is observed by listening to the individual with ASD talk, he or she may repeat (echolalia) words or sounds frequently. Systemizing action sequences is when the individual with ASD fixates on a move, movie, song, etc. and listens or watches it over and over again. Musical systemizing is when an individual using an instrument, plays or sings the same song over and over again (Baron-Cohen, 2009). Each system has its own, individual characteristics that separates it from the other, but always, there is a specific fixation on something and making and using rules relevant to the fixation.

When systems have rules, it helps an individual predict what will happen and how he/she should react within the system (Baron-Cohen, 2009). While WCC, ED, and ToM focused separately on the deficits the individual with ASD experiences (WCC fixations on routines and obsessions, ED inability to control impulses and fixations, and ToM inability to understand others' perceptions), ES theory emphasizes the strength that focusing on details can have for an individual with ASD and the need of learning how to better empathize with others. Furthermore, overtime, ES theory evolved to two separate

theories, ES and the *Extreme Male Brain Theory*. Baron-Cohen (2009) labeled two brain types, the female brain as empathizing and the male brain as systemizing. He believed males tended to be more systematic while females were more empathetic (Baron-Cohen, 2009; Interactive Autism Network, n.d.). He argues that while in the typically developing population individuals have a shared brain type, they do tend to align with the identified gendered characteristics, and individuals with ASD tend to be stronger at systemizing (i.e., the male brain type; Baron-Cohen, 2009).

Although ES theory has some focus on the strengths of individuals with ASD and attempts to provide an explanation for the difficulty individuals with Autism have in empathizing with others there is some pushback surrounding the theory. After evaluating the theory, one individual with ASD considered the continuum Baron-Cohen developed to determine the level of empathizing (E) and/or systemizing (S) in a person. On the continuum, if you have E tendencies you will be further away from S and vice versa (Eartharcher, 2017). According to Eartharcher (2017), as an individual with ASD, she sees a flaw in this, as she does not believe that one is exclusive of the other and that the two can be separate and function well separately. However, ES is unique in that it addresses both the social (empathy) and nonsocial (systemizing) context of ASD (Baron-Cohen, 2009) and it provides context for research into new interventions and methodologies of working with children with ASD (Baron-Cohen, 2009).

Buron and Curtis (2009) utilize the ES theory as a premise for the development of the Incredible 5-Point Scale stating ES theory “implies that by using a system to teach difficult information, we are making use of the person’s learning strengths” (p. 65). The strong focus of systemizing directly aligns with the concept of task analysis as a mode of

teaching appropriate behaviors in the context of varying settings. Moreover, while the ES theory is designed specifically for individuals with ASD, we see evidence of strong systemizing in other disabilities such as anxiety disorders and obsessive-compulsive disorders (Buron & Curtis, 2012). Furthermore, due to the development occurring in children ages three to five, the preschool curriculum emphasizes social and emotional development (including the development of empathy), self-regulation, and the ability to follow multiple step directions and rules (Dodge et al., 2008; RIDE, 2013). Task analysis is often used as a mode of teaching preschool- aged children. Systems such as rules and routines are developmentally appropriate for preschoolers, helps them to learn new concepts, and assimilates those ideas into their daily schemas (National Association of Education for Young Children [NAEYC], 2009; Schepis et al., 2001).

ES was selected as the theoretical framework for this study for two reasons; first, the primary foci of ES theory and the development of preschool-aged children share similarities in that individuals with ASD exhibit some developmental milestones and needs that are common in preschool aged children, specifically the development of empathy (Baron-Cohen, 2009; Buron & Curtis, 2012; Dodge et al., 2008), executive functioning (EF; Kriete & Noelle, 2015), and the need for routines, tasks, and consistency (Baron-Cohen, 2009; Buron & Curtis, 2012; Dodge et al., 2008; Snodgrass, Meadan, Otrosky, & Cheung, 2017). The second reason ES was selected as the theoretical framework was because in the development of their Incredible 5-Point Scale, (the independent variable for the present study), Buron and Curtis (2012) utilized Baron-Cohen's (2009) ES theory as the theory driving the development and rationale for the tool.

### **Conceptual Framework:**

The conceptual framework for this study, behavior therapy (BT), also known as behavioral psychotherapy, focuses on changing the behavior of an individual through the utilization of learning techniques (Bothamley, 2002). BT was selected as the conceptual framework for this study as it provided a guide for how to implement the intervention with the participant. Spiegler (2016) proposes four themes defining behavior therapy; scientific, active, present focus, and learning focus. The first theme is scientific which considers the importance of empirical studies and precision in the development and delivery of interventions. There is also a strong focus on data collection throughout the therapy.

The second theme is the active theme. This theme emphasizes *doing* as opposed to solely speaking about the issues that one is encountering. For example, having the child slowly encounter situations where he is separated for short periods of time from his parents if he has issues of separation anxiety. There are several EBP utilized in order to do this and they include reinforcement-based approaches, problem-solving training, operant and classical conditioning, and behavioral rehearsal (Antony & Roemer, 2011). In the present study, several EBP will be used including operant conditioning through direct instruction, prompting, behavioral rehearsal, and visual cues.

The third theme is present focus. Present focus suggests that any issues the individual is having or experiencing are due to present circumstances and past experiences are not dwelled upon. The fourth and final theme Spiegler introduces is learning focus. Learning focus emphasizes the learning that occurs to develop adaptive

behaviors during therapy, and it builds upon learning principles and theories “such as classical and operant conditioning” (Spiegler, 2016, pp. 7).

**Figure 2. The Present Study’s Relevance to Spiegler’s Process of Behavior Therapy**

Spiegler (2016) Process of Behavior Therapy	Relevancy to Current Study
Identify the problem	After a discussion with <i>Ms. McBride</i> it was determined that <i>Mason’s</i> target behavior, inappropriate play with peers was impacting the safety of all children in the classroom as well as the participant’s social relationships with other children in the classroom.
Determine the goals of the intervention	The goal of the intervention was to decrease the occurrences of the target behavior.
Identify a specific target behavior	The researcher used open-ended questions to determine specifically what the five levels of the target behavior were, with emphasis on determining overt behaviors that were easily identifiable.
Determine what will stay the same and what will change to maintain/change the behavior.	Data collection occurred during the same 3 activities each visit. The rules and expectations of the classroom and activities remained constant, the only thing that changed from an intervention standpoint was when the independent variable was implemented for intervention. Other changes that occurred were natural changes in the scope of a classroom (i.e. student attendance, where the participant chose to play and with whom, etc.).
Identify the intervention plan.	It was decided that a multiple-probe design would be used across activities. The researcher and teacher determined the activities where the target behavior occurred most frequently and in what order the phases would receive intervention.
Implement the plan	Baseline data probes were collected for the first phase on two separate occasions. The behavior was evident and was potentially harmful to the participant and other children in the classroom, so after establishing two baseline probes the intervention was implemented for the first phase. Once trend was met in the first phase and baseline data was gathered in phase two the intervention was implemented. During phase one and two intervention baseline data probes continued to be collected for phase three. Phase three intervention began once a trend was identified in phase two. Finally, once a stable trend was determined for phase three intervention, all data collection ended on the same day.
Analyze the Data	Visual analysis, percentage of nonoverlapping data points, and percentage of data exceeding the median were utilized to determine the effectiveness of the scale across all three activities.
Complete follow-up observations/ assessments	Two maintenance observations will be conducted at one and three months after the study has ended.

**Figure 3. Alignment of the Present Study to Antony and Roemer's (2011)**

**Seven Characteristics of Behavior Therapy**

<b>Antony &amp; Roemer</b> (2011; E-text, Chapter 1, location 225-249)	<b>The Present Study</b>
The focus of BT is on changing behavior.	The Incredible 5-Point Scale was purposefully designed for the participant to change the target behavior (inappropriate play with peers). Within the social story and direct teaching of the scale specific attention was given to teaching <i>Mason</i> how his peers may feel when he played in different manners and was used to teach <i>Mason</i> appropriate behaviors for interacting with his peers.
Behaviors are seen as functional.	<i>Ms. McBride</i> determined the target behavior (inappropriate play with peers) and clearly defined the behavior in five observable levels. She identified the function of the behavior as attention seeking prior to the development of the individualized scale.
BT is rooted in empiricism.	This study followed the recommended practices for SSD per CEC's (2014) guidelines for EBP. Baseline data was gathered before the intervention was implemented. Intervention was implemented on a staggered schedule and baselines continued throughout each phase until the intervention was implemented for each activity. Data collection ended for all phases at the same time. (Multiple-Probe, Single Subject Design). Furthermore, EBP (behavioral rehearsal, prompting, modeling, social narratives) were incorporated as the intervention tool was applied.
BT is active.	The Incredible 5-Point Scale was actively used during all intervention phases throughout the study. Direct instruction, questioning, behavioral rehearsal, prompting, a social narrative, and visual aids were used to teach the scale. Verbal prompting and visual cues were utilized during the implementation. <i>Mason</i> and the adults in the classroom interacted with the scale throughout the intervention phase of the study.
BT emphasizes variables that maintain behavior.	The multiple-probe across activities design utilized a staggered implementation of the intervention. Throughout the study baseline data was gathered for phases that had not yet received the intervention. During intervention probes for target behavior were collected. Target behavior was recorded as frequency and then calculated into rate per minute. The intervention tool was utilized consistently per the staggered implementation schedule.
BT is transparent.	<i>Mason's</i> interests were considered as the scale was developed, and it was individualized to meet his needs. Once the scale was developed <i>Mason</i> identified with the characters in the story and began to name the characters with the names of the children in his class. Parents were provided information regarding the scale and the process of the study. Once maintenance is completed the parents will be provided with a copy of "The Incredible 5-Point Scale: The Significantly Improved and Expanded Second Edition; Assisting students in understanding social interactions and controlling their emotional responses: 2" (Buron & Curtis, 2012).
BT is time limited.	Baseline data collection started on the same day across all three phases. The intervention phases had staggered starting dates and data collection ended on the same day across all phases. The study lasted seven weeks from the first day of baseline data collection to the final day of intervention.

Spiegler (2016) also discusses the four common characteristics of behavior therapy. First, behavior therapy is individualized, and it usually addresses a specific target behavior which requires assessment data and individualization. Behavior therapy tends to follow a stepwise progression in that tasks, responsibilities, commitments become more difficult as the individual participates in the therapy. The third characteristic considers treatment packages, meaning that more than one therapy is being

combined. Finally, Spiegler addresses the brevity of the treatment. Behavior therapy is generally used to address one target behavior and is implemented for a brief time compared to other methods. This means that the therapy and intervention typically does not last long (generally between eight and 20 sessions) before achieving results (Spiegler, 2016, p.8). According to Spiegler (2016), there are eight steps in the process of behavior therapy. For the present study the researcher worked through the steps with the teacher in order to develop and implement the intervention (See Figure 2).

Spiegler (2016) discusses the importance of the therapist-client relationship. It is necessary for the person delivering the intervention (the teacher) and the individual participating in the intervention (the student) to collaborate with one another as the therapist facilitates the procedures (Spiegler, 2016). Antony and Roemer (2011) identify seven characteristics that behavior therapists adhere to as they consider their work in BT, and each characteristic plays a critical role in ensuring the success of the method. Figure 3 provides Antony and Romer's (2011) seven characteristics of BT as well as how the researcher maintained the integrity of BT in the present study.

### **Evidence-Based Practices (EBP)**

Over the last two decades there has been an increased interest in the use of EBPs regarding the implementation of interventions in schools. According to a definition provided by the IRIS Center, EBPs are “any of a wide number of discrete skills, techniques, or strategies which have been demonstrated through experimental research or large-scale field studies to be effective” (IRIS Center, 2018, Glossary). Many professional organizations such as the American Psychological Association (APA), American Speech and Hearing Association (ASHA), the National Professional



Development Center (NPDC) on ASD, and the Council for Exceptional Children (CEC) have developed guidelines for interventions to be determined as EBP. The CEC developed specific classifications of EBP in special education which include, evidence-based practice, potentially evidence-based practice, mixed evidence, and insufficient evidence (CEC, 2014). Currently, the Incredible 5-Point Scale is considered to have insufficient evidence as an EBP. The CEC (2014) provides the following guidelines for an intervention to be deemed EB:

- (a) Must be supported by at least two methodologically sound group comparison studies with random assignment to groups, positive effects, and at least 60 total participants across studies; four methodologically sound group comparison studies with non-random assignment to groups, positive effects, and at least 120 total participants across studies; or five methodologically sound single-subject studies with positive effects and at least 20 total participants across studies; OR (b) Meet at least 50% of criteria for two or more of the study designs described in (a). For example, the practice is supported by one methodologically sound group comparison study with random assignment, positive effects, and at least 30 total participants, as well as three methodologically sound single subject research studies with positive effects and at least 10 total participants; or three methodologically sound single-subject studies with positive effects and at least 10 total participants, as well as two methodologically sound group comparison studies with non-random assignment, positive effects, and at least 60 total participants; AND (c) Include no methodologically sound studies conducted with negative effects

and at least a 3:1 ratio of methodologically sound studies with positive effects to methodologically sound studies with neutral/mixed effects. For this item, CEC considers group experimental, nonrandomly assigned group comparison, and single-subject design studies collectively. (pp.8-9)

**Figure 4. Quality Indicators per CEC (2014) for SSD Research Studies**

Area	Indicator
Context/Setting	The study must describe “critical features of the context or setting relevant to the review” (CEC, 2014, p. 3).
Participants	The study must describe the demographics and “disability or risk status of the participants” (CEC, 2014, p.3) and what method was used to determine the participant’s eligibility status.
Intervention Agent	The study must describe the role of the person implementing the intervention and any necessary background variables that may be relevant to the study. The study also needs to identify necessary training and qualifications the person providing the intervention has with the tool and whether or not he/she met them (CEC, 2014, p.3).
Practice	The study must describe the intervention procedures in detail as well as the actions of the individual providing the intervention or the study must cite “one or more accessible sources that provide this information” (CEC, 2014, p.3). The study must describe the intervention materials in detail, “or cites one or more accessible sources providing this information” (CEC, 2014, p.3).
Fidelity	“The study assesses and reports implementation fidelity related to adherence using direct, reliable measures” (CEC, 2014, p.3) The study must assess and report “implementation fidelity related to dosage or exposure using direct, reliable measures” (CEC, 2014, p.4) and where relevant implementation fidelity should be assessed and reported “(a) regularly throughout implementation of the intervention... and (b) for each interventionist, each setting, and each participant or other unit of analysis” (CEC, 2014, p. 4). A note is made that “If either adherence or dosage is assessed and reported, this item applies to the type of fidelity assessed. If neither adherence nor dosage is assessed and reported, this item is not applicable” (CEC, 2014, p. 4).
Internal Validity (IV)	In order for the rigor to be met for IV the researcher must control for and systematically manipulate IV. The study should describe the baseline conditions and ensure that prior to the initial intervention implementation the participant does not have access to the intervention (CEC, 2014, p.4). For SSDs there must be (1) three or more “demonstrations of experimental effects at three different times” (CEC, 2014, p.4), (2) at least three baseline data points “(except when fewer are justified by study author due to reasons such as measuring severe or dangerous problem behaviors...) (CEC, 2014, p.4) and a baseline pattern should be established that identifies “undesirable future performance” (CEC, 2014, p.5), and (3) common threats to IV are controlled for eliminating “plausible, alternative explanations for findings” (CEC, 2014, p.5).
Outcome Measures and dependent variable (DV)	Outcomes must be socially significant, and the study must provide a clear definition and description of how the DV was measured (CEC, 2014, p.5). The study must report “the effects of the intervention on all measures of the outcome targeted by the review..., not just those for which a positive effect is found” (CEC, 2014, p.5). in order for a phase to be considered as a demonstration of experimental effect there must be “a minimum of three data points per phase... (except when fewer are justified by study author due to reasons such as measuring severe or dangerous problem behaviors...)” (CEC, 2014, p.5) and the “frequency and timing of outcome measures” (CEC, 2014, p.5) must be appropriate. Strong evidence for internal reliability must be proven, $\geq .80$ must be met to meet the standard for interobserver agreement (CEC, 2014, p.5).
Data Analysis	A SSD graph must clearly represent the “outcome data across all study phases for each unit of analysis... to enable determination of the effects of the practice” (CEC, 2014, p.5). Regardless of the analysis used within the study, “graphs depicting all relevant dependent variables targeted by the review should be clear enough for reviewers to draw basic conclusions about experimental control using traditional visual analysis techniques” (CEC, 2014, p.5).

In addition to determining the classifications and guidelines for an intervention or teaching technique/tool to become an EBP the CEC also provides quality indicators for individual studies. The quality indicators determine whether or not an individual study meets the appropriate rigor for consideration in a literature review to determine the efficacy of the intervention or teaching technique/tool. The type of study performed is critical to determining whether or not it will be used when determining the efficacy of a specific intervention. All studies must be experimental in nature and can be group or single subject designs (CEC, 2014). As a rigorous, experimental design, single-subject research has provided a great deal of insight to the field of education regarding EBP (Horner et al., 2005). According to the CEC (2014), in order for a study utilizing a SSD including multiple-probe design to meet the appropriate rigor and provide support for an intervention as an EBP it must meet specific indicators within eight areas (context and setting, participants, intervention agent, description of practice, implementation fidelity, internal validity, outcome measures/dependent variable, and data analysis) addressed in Figure 4.

In their comprehensive review of the literature on EBP utilized when working with individuals with ASD, Wong et al. (2015) identified two primary types of practices considered in the research regarding EBP, comprehensive treatment models (CTM) and focused interventions. CTMs are identified as being organized around a conceptual framework and designed to impact broad learning or development (Wong et al., 2015), whereas according to Odom, Collet-Klingenberg, Rogers, and Hatton (2010), focused interventions are designed to impact a “specific skill or goal of a student...” (as cited in Wong et al., 2015). CTMs are generally used to address multiple outcomes and therefore

are implemented over a longer span of time while the primary purpose of focused interventions rests on one skill/goal and therefore are implemented for a shorter time (Wong et al., 2015).

**Figure 5. Efficacious EBP for Preschool Aged Children with ASD**

Antecedent- based intervention (ABI)	Pivotal response training (PRT)	Prompting (PP)
Differential reinforcement of alternative, incompatible, or other behavior (DRA/I/O)	Discrete trial teaching (DTT)	Reinforcement (R+)
Exercise (ECE)	Response interruption/redirection (RIR)	Scripting (SC)
Extinction (EXT)	Functional behavior assessment (FBA)	Self-management (SM)
Functional communication training (FCT)	Social narratives (SN)	Social skills training (SST)
Modeling (MD)	Naturalistic intervention (NI)	Task analysis (TA)
Parent-implemented intervention (PII)	Technology-aided instruction and intervention (TAII)	Time delay (TD)
Peer-mediated instruction and intervention (PMII)	Picture Exchange Communication System (PECS)	Video modeling (VM)
Visual supports (VS)		

During their review of focused interventions, Wong et al. (2015) determined 27 interventions for working with individuals with ASD that met the rigor necessary to be considered EBPs (Wong et al. 2015). The article further divided the interventions by the

age of participants in the studies. The data indicated that 25 of 27 identified EBP held efficacy for preschool aged children with ASD (See Figure 5). Additionally, upon further analysis and comparison between the work of Buron and Curtis (2012) and Wong et al. (2015), the researcher of the present study determined that 16 of the 27 EBP identified by Wong et al. can and have been used when implementing the Incredible 5-Point Scale, the independent variable for this study (See Figure 6).

**Figure 6. EBP Used with the Incredible 5-Point Scale**

Cognitive behavioral intervention (CBI)	Discrete trial teaching (DTT)	Prompting (PP)
Functional behavior assessment (FBA)	Parent-implemented intervention (PII)	Reinforcement (R+)
Modeling (MD)	Pivotal response training (PRT)	Task analysis (TA)
Naturalistic intervention (NI)	Self-management (SM)	Video modeling (VM)
Response interruption/redirection (RIR)	Social narratives (SN)	Visual supports (VS)
Social skills training (SST)		

According to Suhrheinrich, Hall, Reed, Stahmer, and Schreibman (2014), professionals in educational fields hold a common value that interventions are to be selected based on efficacy and scientific evidence (as cited in Wong et al., 2015) not to

mention, since the reauthorizations of key educational policy (NCLB [2001], IDEIA [2004], and most recently ESSA [2015]) the necessity and importance of EBP have been at the forefront of local, state, and national discussions regarding student success and school accountability. While there is significant research on EBP for individuals with ASD, studies solely focused on children with DD are limited at this time (Mattern, 2015). Therefore, the overall lack of research for interventions for children with DD and the continued interest and importance of the use of EBP in educational settings further necessitates this study.

### **Behavior Development and Evidence-Based Practices in Preschool**

The Abecedarian Project and the High-Scope Perry Preschool Project, two longitudinal studies completed over a 35 year-span, each determined a correlation between high-quality preschool programming and positive long-term outcomes for children through adulthood (Carolina Abecedarian Project, 2018; HighScope, 2018). During the preschool years children with and without disabilities are learning how to regulate their emotions (NAEYC, 2009). This can often cause serious behavioral challenges in the classroom (NAEYC, 2009; Ritblatt et al., 2017). Early intervention for the behavioral challenges can help to prevent more severe emotional disorders to form as children age (Gillis & Butler, 2007; Menzies & Lane, 2011; Reynolds, Ou, Mond, & Hayakawa, 2017; Ritblatt et al., 2017). For educators to properly develop and implement interventions it is necessary for them to 1) understand preschool development and developmentally appropriate practices (Division for Early Childhood [DEC], 2014; Dodge et al., 2008; Jackman, Beaver, & Wyatt, 2015; NAEYC, 2009), 2) understand the cause for the behaviors (Buron & Curtis, 2012; Dodge et al., 2008; Menzies & Lane,

2011; NAEYC, 2009), 3) select developmentally appropriate, evidenced-based practices (Gargiulo & Bouck, 2018; NAEYC, 2009; Wong et al., 2015), 4) successfully complete training on the intervention they are using (Buron & Curtis, 2012; NAEYC, 2009), and 5) implement the intervention consistently and with fidelity (NAEYC, 2009; Singh & Umakant, 2018).

Young children develop rapidly and professionals working with preschool aged children need to be knowledgeable of typical preschool development. The curriculum for children birth to five is designed using a developmental continuum (Beaty, 2014; Dodge et al., 2008; RIDE, 2013). During the preschool years (ages three to five) there are four primary developmental domains that professionals plan for; 1) social/emotional (SE), 2) physical, 3) cognitive, and 4) language (Dodge et al., 2008; NAEYC, 2009). When educators are aware of typical development, they are able to utilize observations to identify what is happening when a child exhibits a behavior that may be challenging and draw conclusions as to whether or not the behavior is typical behavior expressed by three to five-year-olds. Professionals then use EBP such as a functional behavioral analysis (FBA) to identify the purpose of the behavior in order to develop and implement an intervention that is appropriate to the child's needs (Dodge et al., 2008; Jackman et al., 2015; NPDC, 2018). Two domains, SE and cognitive development, are discussed as they relate to behavior development in preschool aged children (Dodge et al., 2008).

Development occurs in the SE domain through the "child's sense of self... taking responsibility for self and others...(and) behaving in a prosocial way" (Dodge et al., 2008 p.19). Some items seen on the preschool developmental continuum include, learning how to regulate behaviors, following rules and routines, expressing empathy, and solving

conflicts (Dodge et al., 2008; RIDE, 2013) which are developmental milestones that we also see within the theories relevant to ASD. Some specific characteristics we see in preschool aged children as it relates to SE development are the following: at three children enjoy receiving praise and attention for the behaviors and skills they are exhibiting (Dodge et al., 2008, p. 23). Four-year-old children become more social and enjoy making friends. They want to know you are paying attention to them and seek out reinforcement for their behaviors (Dodge et al., 2008 p.24). Five-year-old children tend to be very social and are generally able to have close friendships with other children (Dodge et al., 2008; Jackman et al., 2015).

Self-regulation and social skills rapidly develop during the preschool years. Often, children with DD develop these skills at a slower rate than their typically developing peers (Singh & Umakant, 2018). In order for educators to encourage development in this domain there are several EBP that are used in classrooms. Some examples include, modeling, prompting, social narratives, social skills training, and video modeling. Modeling (MD) is utilized when an adult or peer demonstrates the desired behavior and the child receiving the intervention imitates the behavior (Brown & Conroy, 2011; NAEYC, 2009; NPDC, 2018; Wong et al., 2015).

Prompting (PP) is implemented by providing a prompt for a desired behavior and the prompt can be verbal, physical, visual, or gestural and can be provided by an adult or peer (Biederman, Fairhall, Raven, & Davey, 1998; Brown & Conroy, 2011; NPDC, 2018; Snodgrass, Meadan, Otrsky, & Cheung, 2017; Wong et al., 2015). After the prompt is given the child receiving the prompt is expected to exhibit the desired behavior (Biederman et al., 1998; Brown & Conroy, 2011; Snodgrass et al., 2017; Wong et al.,



2015). For example, a teacher may say to a student, “What do we say when a friend helps us?” and the child should respond by saying “thank you”.

Social narratives (SN) often called Social Stories™, are brief stories describing a situation one may encounter with other individuals. The story details an interaction and the appropriate behavior that should follow (Bayat, Mindes, & Covitt, 2010; Jones & Keiper, n.d.; NPDC, 2018; Wong et al., 2015). Through the use of techniques like role playing and play, social skills training (SST) educators teach children with ASD how to appropriately interact with other individuals (NPDC, 2018; Wong et al., 2015). Video modeling (VM) is similar to a social narrative in that a scenario is provided to a child demonstrating the desired target behavior, however, rather than a story being read aloud to the child a video of the scenario is played for the child to watch (Wong et al., 2015; NPDC, 2018; Center on the Social and Emotional Foundations for Early Learning [CSEFEL], n.d.). It’s important to note that many of these interventions are also used in modifying behaviors through the other developmental domains.

Cognitive development also has a critical impact on a child’s behavior development. As children begin to develop cognitive processes, they can start taking the perspectives of others, have stronger problem-solving abilities, and are able to create solutions in new contexts using prior information and experiences (Dodge et al., 2008; RIDE, 2013). When considering preschool-aged children, typical characteristics of cognitive development include egocentrism in three-year-olds however, they can show empathy to others (Dodge et al., 2008, p. 24). Four-year-old children often have a difficult time differentiating between fact and fiction (Dodge et al., 2008, p. 24). Due to this we may notice children begin to ‘lie’, however, often children at this age do not

understand or realize that they are lying (Dodge et al., 2008, p. 25). Five-year-old children are making connections between their experiences and generally have better problem-solving skills (Dodge et al., 2008, p. 26).

According to information reported by CDCHU (2011), the preschool years see extreme development in executive functioning (as cited in Jackman et al., 2015). As we consider the typical development of preschool aged children, it is also pertinent, at this point to think back to the information presented on ToM and EF. In a review of the literature Wong (2004) discussed that research generally shows an improvement in ToM and EF specific to inhibitory control in children with ASD between the ages of 3 to 5 (p. 54). Further emphasizing this point, Kriete and Noelle (2015) share that “in young children with autism, executive abilities appear developmentally appropriate when compared with controls matched for age and verbal ability” (p. 2).

Executive functioning and the ability to regulate one’s behaviors are an essential developmental component in the preschool years. Often, children with DD demonstrate difficulty in these areas and EBPs are utilized to encourage development of these skills. EBPs commonly used in preschool to aid in cognitive development include but are not limited to discrete trial training, pivotal response training, self-management, and task analysis (NPDC, 2018; Wong et al., 2015). Discrete trial training (DTT) requires a service provider (be it teacher or other specialist) to work with a child on a series of trials consisting of instruction for appropriate target behavior, evaluation of the child’s response, implementation of a consequence dependent upon the child’s response, and a break between the end of the trial and presentation of the next trial (Wong et al., 2015).

Pivotal response training (PRT) relies on the use of learner motivation. Delivered in a play therapy environment, interventionists incorporate the interests of the child into the therapy in order to motivate him/her to perform specific tasks. PRT is often an intensive intervention for children with ASD, provided 25 hours a week (Autism Speaks, 2018; Wong et al., 2015). Self-management (SM) is an EBP utilized to encourage the child to discriminate between desirable and undesirable behaviors. Children are taught to monitor and reward themselves for their behavior (Wong et al., 2015).

During preschool children learn how to follow a series of instructions. In order to do so directions are broken down into smaller tasks. Task analysis (TA) is another EBP utilized in preschool settings for children with a variety of disabilities (NPDC, 2018; Snodgrass, et al., 2017; Wong et al., 2015). TA is beneficial as it is developmentally appropriate for preschool aged children and it aligns with Baron-Cohen's ES theory in that individuals with ASD perform better by creating systems in their environments. Wong et al. (2015) define TA as "a process in which an activity or behavior is divided into small, manageable steps in order to assess and teach the skill" (p. 1960). Like the EBPs mentioned previously these four interventions can be utilized across the developmental domains in preschool and are not solely limited to the cognitive domain.

As preschool children with and without disabilities develop their ability to understand rules and regulate their own behaviors, they need time to adjust to change (Jackman et al., 2015, p.88). They benefit from the use of visual aids to help form understanding (Beaty, 2014) and from schedules and routines as it provides them with security and helps to build trust (Beaty, 2014; Connors- Burrow, Patrick, Kyzer, &

McKelvey, 2017; Dodge et al., 2008; Jackman et al., 2015; NAEYC, 2009). Moreover, it is well known that the earlier interventions begin for children with exceptionalities such as ASD or DD the better the overall outcomes (Gillis & Butler, 2007; Menzies & Lane, 2011; Reynolds et al., 2017; Ritblatt et al., 2017).

### **Developmental Delay**

In order for most individuals to receive educational services and supports through IDEA they must qualify under one of the thirteen eligibility categories (deaf-blindness, ASD, emotional disturbance, intellectual disability, hearing impairment, deafness, visual impairment, traumatic brain injury, multiple disabilities, speech or language impairment, specific learning disability, other health impairments, or orthopedic impairment).

However, in the late 1980s early 1990s, parents and professionals began to become concerned about the overall developmental impact and stigma associated with labeling children at such a young age. Taking that into consideration, during the 1991 reauthorization of IDEA (the law became IDEA in 2004) states were granted a special provision that allowed them to utilize more generic terms for identifying and providing eligibility to young children (three through nine years old) (Allen and Cowdery, 2015; Deiner, 2013; Gargiulo, 2015; Gargiulo & Kilgo, 2014). Then, during the 1997 reauthorization of IDEA, the common term, developmental delay (DD) was established (Deiner, 2013). One of the stipulations of the new adoption was that states could choose whether or not they wanted to include DD as an eligibility category; forty-two of the fifty states currently recognize the term (Gargiulo & Kilgo, 2014).

Upon authorization, the federal government required states that chose to use the more generic terms develop their own definitions and eligibility criteria to qualify for

services and supports under IDEIA for DD (Gargiulo & Kilgo, 2014). Moreover, once a state decided to use DD as a form of eligibility for services, an additional provision was that school districts were able to choose whether or not they too would accept the term (Learning Disabilities Association of America [LDA], n.d.). Early childhood education licensure in which the study took place, covers the span of preschool through eight years old and therefore has limited eligibility for DD to children three through eight. [Masked] Department of Education's (n.d.) eligibility criteria for DD follows:

twenty-five percent (25 percent) delay and/or score equal to or greater than two standard deviations below the mean in one of these areas of development listed below; or a score equal to or greater than 1.5 standard deviation below the mean in two or more of the following areas: physical development, cognitive development, communication development, social or emotional development, and/or adaptive development. (p.6).

In order to diagnose a child as having DD specialists utilize norm-referenced tests such as the Bayley Scales of Infant and Toddler Development (Currie et al., 2012). Due to the broad definition and purpose of the label developmental delay, characteristics of individuals with DD vary greatly. According to Singh and Umakant (2018) when a child has a developmental delay, we see a significant lag involving developmental “domains such as physical, communication, problem solving and personal and social areas...” (p. 234). Often children with DD experience issues with social competency (Lewallen & Neece, 2015) and present with behavioral disorders. Brown and Conroy (2011) assert children with developmental delays “display chronic problem behaviors that affect their performance” (p. 313). As children age developmental delays are often relabeled as an

intellectual disability (Deiner, 2013). However, as a child grows and develops, natural development and maturation or the interventions provided to the child may have a significant enough impact that the child no longer needs nor qualifies for special education services.

The educational research supporting EBP for DD is growing, however, at this time is fairly limited (Mattern, 2015). Information we have indicates a strong positive correlation between early intervention services and developmental outcomes for children labeled as having a DD (Mattern, 2015; Singh & Umakant, 2018). During the early childhood years development is tracked through a developmental continuum. Atypical development in children does not follow the continuum therefore, early intervention services are recommended in order to reduce the impacts of any possible delays (Mattern, 2015). Furthermore, Gillberg (2010) states “early disorders such as DD, whether global or specific, requires that care should be given to the composite of deficits rather than to any well-defined developmental domain, at least until the specific nature of the deficit becomes dominant” (as cited in Levy, 2011, p. 182). The DEC (2014) developed recommended practices for providing interventions and services to children with DD. The development of the recommended practices were built on the premises that recommended practices have high leverage outcomes; are evidence-based; are representative of a breadth of knowledge regarding DD; are observable; are not designed for solely one disability (as developmental delays can impact across domains overall development); service delivery occurs in a variety of settings; and they should build upon existing standards developed for early childhood settings (DEC, 2014).

As IDEIA changes and our understanding of child development, interventions, and students' needs changes so do the delivery methods of our interventions. Interventions have become more individualized with a focus on functions of behavior (Brown & Conroy, 2011). One recommendation made by NAEYC (2009), DEC (2014), and Singh and Umakant (2018) is that there should be strong coordination between the school and home. Singh and Umakant (2018) state that this connection "demands designing an intervention program that includes as many facets of the child's life as possible" (p. 236). Research identifies reinforcers, prompting, modeling, video modeling, specific verbal cues, and task analysis as common interventions utilized for children with DD (Biederman et al., 1998; Brown & Conroy, 2011; Cihak, Smith, Cornett, & Coleman, 2012; CSEFEL, n.d.; Snodgrass, et al., 2017). The aforementioned practices align with the work of Wong et al. (2015) and the EBP utilized in the development and implementation of each individual Incredible 5-Point Scale, which also align with DEC recommended practices.

Overall, the research regarding DD is fairly new in the field of education. While there is limited research available (Mattern, 2015), evidence does point to the efficacy of common interventions such as social stories/narratives, prompting, visual cues, and video modeling (Biederman et al., 1998; Brown & Conroy, 2011; Cihak et al., 2012; CSEFEL, n.d.; NPDC, 2018). The limited research in the field surrounding DD is an additional indication of the importance of the present study and its possible implications to the field of early childhood special education.

### **The Incredible 5-Point Scale**

One quick search for the Incredible 5-Point Scale on Twitter will show a person that 1) the Incredible 5-Point Scale is widely used both domestically and internationally, and 2) that individuals using the scale love the results they are getting (Twitter, 2019). What the search doesn't show somebody is research to support the tool's efficacy and use in the classroom. Additionally, a scholarly review of the literature does not locate any published empirical studies of the scale.

The Incredible 5-Point Scale was developed in 2003 and revised in 2012 by Kari Dunn Buron and Mitzi Curtis as a behavior support tool to be used for individuals with ASD and served as the independent variable for the present study. The tool was originally created for individuals with ASD to learn to generalize appropriate behaviors by replacing or teaching self-regulation skills for specific target behaviors (Buron & Curtis, 2012). As individuals have implemented the scale, they have found that the benefits of the tool also work for children with a variety of exceptionalities such as DD, obsessive compulsive disorder (OCD), and anxiety (Buron & Curtis, 2012).

The Incredible 5-Point Scale utilizes the components of Baron-Cohen's ES theory, focusing specifically on the trait of systemizing that many individuals with ASD express (Buron & Curtis, 2012). Systemizing is the development of rules for specific systems within the individual's life; this could be behaviors, events, environments, or experiences. When the systems have rules, it helps the individual predict what will happen and how he/she should react within the system (Baron-Cohen, 2009). One example of systematic rules in early childhood education is the use of a consistent schedule or routine. When the schedule or routine remains consistent (follows the rules) it is beneficial to the social emotional development and learning of young children as it



provides a sense of security and control as it enables children to predict what will occur next in their environment (Dodge et al., 2008; NAEYC, 2009).









In order to make rules for a system an individual must take one activity and break it into manageable tasks. The Incredible 5-Point Scale takes advantage of this strength and provides a visual representation of a target behavior to define rules for interacting with others or the environment, or resolving issues concerning the behavior (Buron & Curtis, 2012). For example, if there is a child in the classroom who is unable to control his or her voice volume, a teacher may implement the scale demonstrating that a one is no talking, a two is whispering, a three is a conversational voice and so on.

For the scale to be successful it is important for the interventionist (whether it be a teacher, family member, or other professional) to know how to use it with fidelity. To start, the interventionist needs to determine the target behavior. That means figuring out what the person is currently doing and what it is that the interventionist feels he/she should be doing (Buron & Curtis, 2012). Once the problem has been identified it is critical to figure out what the individual needs to be taught to be successful. After the interventionist has determined what the problem is and what needs to be taught it is time to systemize the behavior by breaking it down into five manageable and understandable levels (Buron & Curtis, 2012).

The scale can be created by the interventionist but there is some evidence that co-creating the scale with the individual who it is being created for is beneficial (Buron & Curtis, 2012). In their book, *The Incredible 5-Point Scale: The Significantly Improved and Expanded Second Edition*, Buron and Curtis (2012) provide templates to help individuals identify 1) what the behavior looks like, 2) what the behavior feels like, and

3) what the person can try to do for each level of a behavior. Dependent on the age and interests of the individual the scale has been developed there is flexibility in what is on the scale. For example, in a preschool setting there may be zero to very few words, but clipart or even characters from a favorite television show maybe used to represent the different levels on the scale. (See Figure 7).

Figure 7. A Comparison Between a Three and a Five-Point Scale

An Incredible 5-Point Scale designed for a preschool aged child with five points.			A modified Incredible 5-Point Scale designed for a preschool aged child with three points.		
5	I am yelling and this is too loud.		3	I am yelling and this is too loud.	
4	I am using an outside voice.				
3	I am using my normal talking voice.		2	I am using my normal talking voice.	
2	I am whispering or using a quiet voice.				
1	I am not talking.		1	I am not talking.	

The next step is to implement the scale. In order to implement the scale, it is necessary to teach the scale to the student and ensure he/she understands what each level looks and feels like as well as what the expectation is and how to meet the expectation

(Buron & Curtis, 2012). The interventionist will work one-on-one with the student and use direct teaching to describe, explain, and check for understanding of the scale.

As the interventionist is teaching the scale, he/she has access to a variety of methods to further understanding of the scale. First, creating the scale with the student helps him/her to have a stronger understanding because his/her words are being used for each component (Buron & Curtis, 2012). Another method to deepen understanding of the scale is through the use of a story (Buron & Curtis, 2012). A social narrative which incorporates each of the five levels of the scale can be developed to teach the student what the behavior looks like and what the expectations are for the different levels of the behavior. A third method could be the use of a video (Buron & Curtis, 2012). The video also provides a visual representation and example of each of the five levels of the scale, but rather than being presented solely in book format it instead uses video modeling to identify the behavior and what the behavior should look like at each level. The final method that will be discussed is the use of role playing. The interventionist can use pretend play and/or puppets to encourage the student to respond to questioning regarding the different levels. For example, the interventionist may provide examples of situations where the target behavior may occur or has occurred and ask the other child to share what might happen or what should happen. Once the child understands what is being represented on the scale the intervention can be implemented (Buron & Curtis, 2012).

Like any intervention, once the scale has been implemented it is important that it is used consistently (Buron & Curtis, 2012). A benefit of the Incredible 5-Point Scale is its flexibility of use. It can be adapted to meet the developmental needs of preschool-

aged children. Preschool children with and without disabilities are developing the ability to follow multiple step directions and tasks. A developmentally appropriate expectation at this age is to follow two to three step directions (RIDE, 2013). While some preschool children would understand, and perform well with a 5-point scale, the Incredible 5-Point Scale can be modified to have three tasks to meet varying developmental needs (Buron & Curtis, 2012). Consider the voice volume scale example previously provided (See Figure 1); if the scale were adapted to have three points it would be appropriate for level one to be no voice or whispering, level two to be normal conversational voice, and level 3 an outside voice. The scale would still have five lines but only three would be utilized (Figure 7 is an example of a comparison between the two options).

Buron and Curtis make the argument that if a three-point scale is utilized, but five levels are still visible, it makes the transition to a five-point scale easier as the child develops the ability to follow more directions and tasks (Buron & Curtis, 2012). An additional modification for preschool aged children is replacing the numbers with pictures of favorite characters or focus on the colors of the scale. Developmentally preschoolers are learning number recognition, so the use of numbers may or may not be beneficial depending on the child's level of development (Buron & Curtis, 2012, RIDE, 2013).

An additional benefit of the Incredible 5-Point Scale is its ease of use. The scale is often found in classrooms, however, with proper training it can easily be utilized at home and during sessions with specialists (Buron & Curtis, 2012). Again, consider the noise volume example, if families, teachers, and therapists work together to determine appropriate noise volumes and levels on the scale they can all implement the scale in

their settings. The teacher, therapists, family members, and the child are both able to utilize the scale as a means of consistently communicating expectations and/or how the child may be feeling (Buron & Curtis, 2012). This provides consistency between settings and aligns with preschool aged children's developmental need for rules and routines (NAEYC, 2009).

Currently, the Incredible 5-Point Scale is not an EBP. However, some could argue for its efficacy as such due to the EBP utilized as each individual scale is developed and implemented. The Incredible 5-Point Scale utilizes many EBP to teach and implement the scale with individuals including, visual cues/supports (Dodge et al., 2008; NAEYC, 2009; NPDC, 2018; Wong et al., 2015), social stories/narratives (CSEFEL, n.d.; Gargiulo & Bouck, 2018; NPDC, 2018; Wong et al., 2015), video modeling (Boudreau & D'Entremont, 2010; NPDC, 2018; Wong et al., 2015), prompting (NPDC, 2018; Wong et al., 2015), storytelling (Gillis et al., 2007), and task analysis (NPDC, 2018; Wong et al., 2015). Moreover, these same EBP are regularly utilized in preschool classrooms (CSEFEL, n.d.; Gillis et al., 2007; Dodge et al., 2008; Boudreau & D'Entremont, 2010; Wong et al., 2015; Gargiulo & Bouck, 2018) which led the researcher for the present study to believe that the use of the scale as an intervention would decrease the target behaviors exhibited by the participant, a preschool-aged child with DD.

### **Single-Subject Design**

For over a century, single subject design (SSD) studies (also known as single case) have been conducted as an experimental design method that provides researchers with evidence for causal relationships between an intervention and its effectiveness

(Kazdin, 2011). They are commonly utilized in applied research in the fields of psychology and education (Kazdin, 2011; Wong et al., 2015) in order to either “reduce behaviors associated with impairment” (Kazdin, 2011. p. 3) or “increase behaviors that improve functioning” (Kazdin, 2011. p. 3). They provide “A flexible alternative to traditional group designs in the development and identification of evidence-based practice...” (Byiers, Reichle, & Symons, 2012, p. 397) and can “lead to causal knowledge about the impact of the intervention” (Kazdin, 2011, p. vii). SSD relies on the observation of specific target behaviors before and after an intervention is implemented. There are five general requirements that all SSD types follow; 1) continuous assessment: the researcher observes the participant(s) multiple times over time, 2) baseline assessment: this information is gathered prior to intervention to determine the behavior and to predict future behavior, 3) stability of performance: the baseline should be stable prior to the implementation of intervention, 4) trend in the data: once the intervention has been implemented there should be a trend in the target behavior, it could stay the same, improve, or get worse with the intervention, and 5) variability in the data: in SSD too much variability may show that the intervention was ineffective, it is preferable to see a stable trend (Kazdin, 1982, pp.104-109).

There are five designs primarily utilized in SSD: pre-experimental, withdrawal, changing-criterion, multiple-treatment (alternating treatments or adapted alternating treatments), and multiple-baseline (Byiers et al., 2012; Kazdin, 2011). Prior to implementing a SSD study the researcher needs to determine the research question, participants, behavior, and intervention in order to select the appropriate design for the

study. Therefore, it's especially important to have an understanding of the purpose and pros/cons of each design type.

The first design type, the pre-experimental type follows an AB model. This means that the model is designed for the researcher to gather baseline data (A) and then treatment data (B). While this method can provide a researcher with preliminary information regarding an intervention it does not provide experimental control and is therefore considered pre-experimental (Byiers et al., 2012). AB designs are frequently used in schools because they are easy to implement and can provide some data for educators as they incorporate interventions into their classrooms. The remaining SSD types implement a variety of experimental methods which provide researchers options in the design of their studies based on the needs and purpose of the particular research question(s), setting(s), and/or participant(s) being observed. The SSD types will be discussed below.

The second SSD type, withdrawal design or ABA/ABAB, allows for experimental control in that an initial baseline (A) is gathered, intervention (B) is implemented, intervention is removed and new baseline (A) data is gathered, and in some studies intervention is re-implemented (B) to gather an additional data set. This provides experimental control in that after achieving a trend with the intervention it is removed and the participant is observed to determine if the behavior has changed with the removal of the intervention (Byiers, et al., 2012; Kazdin, 1982; Krishef, 1991). In order to meet the WCC standard without reservations, there should be a minimum of five data points in each phase (Byiers, et al., 2012; Kratochwill, et al., 2010).

There are generally two methods to implement ABA/ABAB designs, and these are withdrawal design and reversal design. Withdrawal design is simply removing the intervention and gathering data over a certain time. If the behavior does not return to baseline then it is determined that either the intervention was not effective because the individual does not need the intervention to continue appropriate behaviors or, in some cases it may be determined that the behavior addressed in the intervention cannot be unlearned and therefore the intervention was effective. The general premise is that if the behavior returns to baseline without the intervention it can be determined that the intervention was effective (Byiers, et al., 2012; Kazdin,1982; Krishef, 1991).

Reversal designs require the researcher to attempt to reverse the effects of the intervention (Byiers, et al., 2012). When studies re-introduce the intervention and behaviors once again change after returning to baseline there is further evidence to support the effectiveness of the intervention (Byiers, et al., 2012; Kazdin,1982; Krishef, 1991). While ABAB designs are generally very strong experimental studies one thing researchers need to consider is whether or not the behavior being taught is reversible. If it is not reversible than the study functions more like an AB design because during the 3rd phase of the study (ABA) behavior will not return to baseline (Byiers, et al., 2012). One final consideration of an ABAB design is that there is some ethical consideration and hesitancy in removing an intervention that has been effective for an individual. In some cases, such as an intervention that has shown efficacy in decreasing self-injurious harm or harm to others, the removal of the intervention would be unethical, therefore, the research team should consider an alternative single-subject design type that does not rely on the



removal of the intervention (Byiers et al. 2012). Due to ethical considerations regarding the removal of intervention, an ABAB design method was not selected for this study.

The third design type is the changing-criterion design. The changing criterion design does not require withdrawal from the intervention rather the intervention is designed to change behavior in increments (Kazdin, 2011). For example, if a teacher is trying to increase the amount of time a child spends actively engaged in an activity the teacher will gather baseline data to determine a stable baseline for the amount of time engaged. Next, the teacher will determine an intervention, generally a reward of some sort, for meeting the specific criterion (Byiers, et al. 2012; Kazdin, 2011). The teacher will set a specific time, let's say three minutes, for engaging in the activity, and once the participant has at least three stable data points (five are better) for three minutes of engagement the teacher will change the time to seven minutes, and so on. The increments of intervention serve as subphases of the intervention and the control for the study (Kazdin, 2011). At least two subphases should occur, however, three or more provides for a more rigorous study (Kazdin, 2011).

While most changing criterion designs utilize specific points (such as three minutes engagement for criterion one, and seven minutes engagement for criterion two) one variation to the design called the range-bound changing criterion design allows researchers to focus on a range to meet criteria (Kazdin, 2011). For example, in intervention subphase one, the child may need to show they are engaged for three to five minutes at a time, and if the child falls within that range he/she receives the intervention (reinforcer); once the child shows stability with the range in phase one it is then increased to a new range for subphase two and so on. According to Kazdin (2011), a limitation to

the changing criterion design is in the level of change. If the change occurs too quickly or too slowly there may be difficulty in drawing inferences from the data, rather the ideal model shows a step-like change in the data (p. 186). Due to the nature of the participant's behavior a changing criterion design would not have been feasible for this study.

The fourth SSD model is the multiple-treatment design. The multiple treatment design allows the researcher to change the intervention after one phase of intervention has been completed. This change can be simply modifying the treatment being used in some way or it can be implementing an all new treatment with the participant. In the literature we see the multiple treatment design written as ABACAC (Byiers, et al., 2012). This design is implemented similarly to an ABAB design, however the baseline (A) directly following the intervention is a withdrawal period from the first intervention. Once a stable baseline has been met then the new intervention (C) is introduced. A CAC model then follows. For example, in a preschool classroom a teacher may be having a difficult time getting a student to clean-up after center time. The researcher would take baseline data and then implement an intervention, such as modeling. After adequate intervention data is collected the intervention would be withdrawn until the participant went back to a stable baseline. Then, a different intervention would be implemented, such as prompting. A baseline and intervention phase would follow (Byiers, et al., 2012).

There are several variations of this SSD model. One of the variations is the alternating treatments or adapted alternating treatments. In this model researchers implement more than one intervention; however, the implementation is started on the same day but at different times. For example, if a child has a difficult time cleaning up

his/her mess in all settings within the classroom the teacher may implement the first intervention (modeling) during centers and the second intervention (prompting) during snack time. The next day prompting may occur during centers while modeling occurs during snack.

One advantage of using a multiple-treatment design is that in some cases, the intervention does not have to be withdrawn. A limitation to the multiple-treatment design is the possibility for multiple-treatment interference. When multiple treatment interference occurs, it is because one treatment had an impact on the other, this makes it difficult to make conclusions about the data (Byiers, et al., 2012). A multiple-treatment design was not selected for this study because the study was only incorporating one intervention, the Incredible 5-Point Scale.

The fifth SSD model is the multiple-baseline or multiple-probe design. These two designs are very similar, with the main difference between the two designs being the number of data points that are collected and if the data is collected concurrently or not across phases. Data for both designs can be collected 1) across behaviors, 2) across settings (activities), or 3) across individuals. The across behaviors and across settings designs consider one individual and looks at developing an intervention for an individual across either different target behaviors or a singular behavior across settings (Byiers, et al., 2012; Kazdin, 2011). An across individuals design considers the same or similar behaviors perpetuated by two or more individuals (Horner et al., 2005; Kazdin, 2011; Krishef, 1991).

In all designs a baseline is gathered for the target behavior until it is stabilized and then the intervention is implemented with the first behavior, setting, or participant.

After the behaviors stabilize the intervention is applied to the next behavior, setting, or participant and so on. The staggering of the intervention should show that the target behavior is not changing without the implementation of the intervention within a phase (i.e., intervention is implemented in snack time, meanwhile baseline continues to be gathered in center time, the behavior changes in snack time, but center time behaviors remain consistent); the importance here is that it is important that a therapeutic trend is occurring only within the phase receiving the intervention. This helps to prevent threats to internal validity (Horner et al., 2005; Kazdin, 1982; Krishef, 1991). Finally, data collection ends for all behaviors, settings, or participants at the same time (Horner et al., 2005; Kazdin, 1982; Krishef, 1991). To be valid, multiple probe designs require: 1) three or more behaviors, settings/activities, or participants, 2) that the baseline data collection begins at the same time across contexts, 3) the intervention is incorporated at different times, and 4) the data collection process ends at the same time for each context (Fraenkel et al., 2012; Horner et al., 2005; Kazdin, 1982; Krishef, 1991).

The benefits of multiple baseline or probe SSD studies include no need for withdrawal of the intervention and it's generally easy to implement the intervention because the intervention is applied to one behavior, setting, or individual at a time (Kazdin, 1982). According to Kazdin (1982), "the underlying rationale of single-case experimental designs is similar to traditional between-group experimentation. All experiments compare the effects of different conditions (independent variables) on performance" (p. 103) and "the goal is to convey the underlying rationale, the logic in relation to the goals of the scientific research, and strength and limitations" (Kazdin, 1982, p. 103). This design is appropriate to respond to the current research question

because it enables the researcher to individualize the intervention while maintaining experimental control throughout the study. Moreover, this design was selected because it addressed the ethical issue of removing an intervention that had the potential of having a positive effect on the participant's social and emotional development and behavior management skills.

### **Chapter Summary**

The literature review discussed the theoretical and conceptual frameworks that have guided the present study. Furthermore, information regarding evidence-based practices and preschool development and behavior management strategies were provided to give a reference to practices that are currently available and what educators know about preschool aged children with and without disabilities. While limited information is available regarding the Incredible 5-Point Scale it was important to discuss its development and current use in educational settings. Finally, the chapter was concluded with information regarding single-subject designs including their efficacy and different models specifically multiple-probe designs. The following chapter will discuss the methodology used in the present study.

## **Chapter III. METHODOLOGY**

### **Introduction**

For the present study, the researcher utilized a multiple probe, single-subject design with one participant (Mason) across three activities (activity one- snack time, activity two- table toy time, and activity three- center time). The independent variable in this study was the Incredible 5-Point Scale (Buron & Curtis, 2012) while the dependent variable was the frequency and rate per minute of the identified target behavior, inappropriate play with peers.

Current educational policy (ESSA, 2015; IDEIA, 2004) require interventions used in school settings to be evidence-based. Therefore, there were two primary purposes of this single-subject, multiple-probe design study. The first purpose was to explore the effectiveness of The Incredible 5-point Scale (Buron & Curtis, 2012) related to addressing target behaviors in preschool children with Developmental Delays (DD). The second purpose of the present study was to provide a foundation for empirical studies of this tool as an EBP.

No study procedures were initiated prior to receiving Rhode Island College (RIC) Institutional Review Board (IRB) approval (See Appendix A). Additionally, the researcher of the present study did not collect any information regarding the site or potential participants prior to receiving formal school district approval, building level approval from the school principal, a signed teacher consent form, and signed parental consent forms for each of the children selected as possible participants for this study (See Appendix B).

### **Research Question and Hypothesis**

The research question guiding this study is: *To what extent does the implementation of The Incredible 5-Point Scale impact target behaviors of preschool children with Developmental Delays?*

At the start of the study, the researcher hypothesized that the frequency of the target behavior, inappropriate play with peers, would decrease with the implementation of the scale.

### **Participants/Sample**

Upon receiving school district authorization and RIC IRB approval, recruitment for this study began by reaching out to a preschool teacher (*Ms. McBride*) via email. The email sent to *Ms. McBride* provided her with a recruitment flier (see Appendix C) and was used to determine her interest in collaborating with the researcher and nominating students for the study. *Ms. McBride* responded quickly to the inquiry indicating that she was interested in participating in the study. Her response resulted in an initial meeting at which time the researcher provided additional information regarding the study and *Ms. McBride* signed a consent form.

Due to the nature of the present study, a single-stage, purposive (non-randomized) sampling procedure (Creswell, 2014; Fraenkel et al., 2012) was utilized to determine which participants to recruit. Therefore, prior to providing recruitment fliers to families the researcher informed the teacher of the eligibility criteria for participants. To meet the criteria as a participant in the study the participant(s) had to 1) exhibit a target behavior identified by *Ms. McBride*, 2) be in preschool, and 3) have no prior experience with the Incredible 5-Point Scale. The following definitions were utilized to clarify descriptions of the participants: 1) children must have a diagnosis of DD and have been diagnosed by

a qualified provider or other testing required by the IDEIA (2004) and diagnosed children were receiving special education services under an Individualized Education Program (IEP) throughout the study; 2) preschool aged children are determined by their ages, three to five years old; and 3) target behaviors are behaviors that required intervention and were identified by the participants' teacher. Ms. McBride was provided with some examples of target behaviors which could range from minor such as the noise level of the child's voice to more severe such as aggression towards others (Buron & Curtis, 2012).

Ms. McBride then distributed recruitment fliers to families of children who exhibited identified target behaviors in the classroom. (See Appendix D). Upon the receipt of a signed recruitment flier with confirmation of interest in the study, parents then received a consent letter either in English or Spanish (dependent upon the family's first language. The materials provided in Spanish were translated by a native Spanish speaker). Five families returned the forms consenting for their children to participate in the present study. Once the consent forms were returned to the researcher, Ms. McBride and the researcher discussed each participant to determine eligibility for the study. The five participants identified in Table 1 were initially selected for the study. (In order to protect their anonymity, all participants and teachers were given a pseudonym).

After the study began and baseline data were collected it was determined that Ivan was exhibiting behaviors (loud voice) that mimicked the voice volume of classroom teachers and other students. Therefore, the study ended at baseline for him. Leo, Thiago, and Matheus exhibited inappropriate body awareness during circle time that included pushing and wrestling during movement opportunities. After several observations gathering baseline data, Ms. McBride changed the format of her circle time from



transitioning to the lesson and attendance with a group movement activity to sitting quietly on the rug and beginning the activity with a student-lead attendance check-in. Once this change was made the behaviors stopped. No intervention was necessary, and the study was ended for Leo, Thiago, and Matheus.

The final participant, Mason, was a four-year-old, Hispanic boy. He was tall for his age and had a contagious smile. Mason was in his third year of preschool with Ms. McBride and would be enrolled in kindergarten the following school year. Mason received special education services for speech and occupational therapy (OT) under the IDEIA eligibility category Developmental Delays. Cognitively Mason was able to follow two and three step directions, identify all of the letters in the alphabet and numbers to 20. When writing he consistently utilized a fist grasp on his pencil, crayon, or marker. However, when prompted and the proper tripod grip was modeled, he was able to hold the writing utensil properly. When Mason first came to preschool he did not speak and recently developed an inconsistent disfluency in speech patterns in which he would stutter throughout his conversations. During outdoor play opportunities Mason was observed running with a typical gait. He was able to throw a ball overhand and kick a ball rolling towards him. When ascending the stairs Mason would use a reciprocal pattern, placing one foot on each stair and sometimes held the stair rail. According to conversation with Ms. McBride, for the two previous school years Mason consistently exhibited the target behavior addressed in the present study.

Throughout the study Mason generally used short utterances when he was engaged in play with others. When he spoke longer phrases, he often stuttered parts of his sentences. He enjoyed interacting with his peers, however he exhibited inappropriate

behaviors towards said peers in which he took things from them during play, teased them with the items he took, ran away with the items, and in some instances hit or kicked peers during an escalated episode. Mason's behaviors were unsafe and limited positive interactions between himself and peers which often resulted in his peers being closely guarded when he was near. Mason's behaviors continued throughout the baseline phase of activity one therefore, the present study continued through two phases, baseline and intervention, across three activities (snack, table toys, and centers).

Table 1

*Participant Information*

Participant	IDEIA Eligibility Category	Demographic Information	Target Behavior
Ivan	n/a	Male 4 y.o. ELL Hispanic 1 <sup>st</sup> year in school	Inappropriate Voice Volume in the Classroom: Inappropriate voice volume in the classroom is defined as any voice volume that can be heard outside of the classroom or on the other side of the classroom whether the entire conversation is decipherable or not.
Leo	Developmental Delay: Speech	Male Hispanic 4 y.o. Second year of PK	Not respecting personal space: Not respecting personal space is defined as any intentional, unsafe touching that may result in children being harmed such as hitting, kicking, rolling on the floor, laying on top of other children, bumping into others, elbowing, pushing, or jostling others. It is also defined as sitting too close to others and includes one child's body (hands, feet, leg, arm, head) touching others in an unwelcome manner.
Thiago	n/a	Male Peer Model White 4 y.o at start of study 5 y.o at end of study 1 <sup>st</sup> year in PK	Not respecting personal space: Not respecting personal space is defined as any intentional, unsafe touching that may result in children being harmed such as hitting, kicking, rolling on the floor, laying on top of other children, bumping into others, elbowing, pushing, or jostling others. It is also defined as sitting too close to others and includes one child's body (hands, feet, leg, arm, head) touching others in an unwelcome manner.
Matheus	Developmental Delay: Receives OT, Speech	Male Two or More Races 5 y.o. 3 <sup>rd</sup> year of PK	Not respecting personal space: Not respecting personal space is defined as any intentional, unsafe touching that may result in children being harmed such as hitting, kicking, rolling on the floor, laying on top of other children, bumping into others, elbowing, pushing, or jostling others. It is also defined as sitting too close to others and includes one child's body (hands, feet, leg, arm, head) touching others in an unwelcome manner.
Mason	Developmental Delay: Speech, OT	Male Hispanic 4 y.o 3 <sup>rd</sup> year of PK in this classroom	Inappropriate Play with Peers: Inappropriate play with peers is defined as a child behaving in either a physically or emotionally aggressive manner. This looks like hitting, spitting, and kicking others or taking things from other children whether it be toys, tools, and other objects, or taunting other children.

*Note.* IDEIA= Individuals with Disabilities Education Improvement Act. OT= Occupational Therapy. y.o.= years old. PK= preschool. ELL= English Language Learner.

## **Setting for the Study**

The present study was completed during the 2018- 2019 school year, in an inclusive preschool classroom at an urban, public school in southern New England. The school in which the study took place provides educational services to children from preschool through 5<sup>th</sup> grade. There are approximately 480 students in the school and 33 teachers.

Of the 33 teachers there is one preschool classroom with one teacher and one paraprofessional. None of the teachers in the school are emergency certified and 96% of the teachers in the school are considered to be highly qualified (Infoworks, 2018). The preschool teacher, Ms. McBride, self-identified as a Hispanic/White, female. At the time of the study she was 31 years-old and had 10 years of early childhood teaching experience, and five of the 10 years were in early childhood special education programs. She held a bachelor's degree in early childhood education, a master's degree in early childhood special education, and was considered highly qualified by the licensing state (McBride, personal communication, February 6, 2019).

Demographic information collected on families in this district showed that 72% of the student population was eligible for free and reduced lunch which indicated that many children come from low-income families. The students and families within the school were diverse. Approximately 49% of the students at the school were Hispanic, while 20% were African American, 17% were White, 9% were Multiracial, and 5% were Asian. The students in the preschool classroom were representative of the school's overall racial/ethnic population. Additional information indicated that 13% of the student population within the school received ESL/bilingual services and 9% of the student

population received special education services (Inforworks, 2018). Two students in the preschool classroom were bilingual, however they were not receiving ESL/bilingual services. Due to the nature and purpose of an inclusive preschool classroom, there was a higher rate of children receiving special education services (50%) in the preschool classroom setting than the overall school demographics for special education services.

The classroom in which the study took place was a large room, on the first floor of the building. It had two entrances on the same wall. Directly opposite of the doors was a full wall of windows that stretched the entire length of the room and allowed for natural light when not covered by student artwork or other items on the radiator. To the right of the door used as the primary entrance and exit of the classroom, was a sink and small table while to the left there were two sensory tables. A small table used for students to sign in at the start of the day was in front of the door. Past the small table were the student mailboxes and the teacher and teacher assistant's desks. On the left side of the sign-in table there was a small recessed wall through an arch with hooks for children to hang their belongings. To the right of the sign-in table there were two long tables used for activities throughout the day. On the left of the tables there was a block center, a dramatic play center, a cozy corner, and a writing center. Right of the two tables were shelves with manipulatives and developmentally appropriate games for preschool aged children. The shelves formed a rectangular space where students participated in rug activities such as circle time. On the far wall, after the two tables and to the right of the primary door was another small table used for student activities such as Playdough.

While large, the overall classroom space was cluttered. There was limited storage space for toys and other classroom materials. The teacher and paraprofessional each had

a small desk. Their personal belongings often remained out in the open either on their desks or chairs. The children knew not to enter the teacher and paraprofessional's desk space. During observations, this space was never disturbed by a child.

### Dependent Variable

Figure 8. Data Collection Tool for Mason

Observer: \_\_\_\_\_ Participant: 5 Date: \_\_\_\_\_

#### Behavior and Definition

Inappropriate Play with Peers: Inappropriate play with peers is defined as a child behaving in either a physically or emotionally aggressive manner. This looks like hitting, spitting, and kicking others or taking things from other children whether it be toys, tools, and other objects, or taunting other children. (Mark behaviors at 4 or 5)

Time	Activity	Occurrence of target behavior (Tally)
	Table Toys	
	Snack Time	
	Centers	
	Book Time	
	Activity	Notes
	Table Toys	
	Snack Time	
	Centers	
	Book Time	

Figure 8. Developed by Beth Pinheiro.

The dependent variable in this study was the frequency of the target behavior, inappropriate play with peers which was calculated into rate per minute (RPM) of the behavior occurrence and was collected utilizing a researcher developed tool (See Figure 8). After a discussion with Ms. McBride, inappropriate play with peers was defined as Mason behaving in either a physically or emotionally aggressive manner towards other children. This looked like hitting, spitting, and kicking others or taking things from other children whether it be toys, tools, and/or other objects, or taunting other children. Taunting was described as Mason taking an item and running away with it and then watching the other child until the child reacted to the situation; as the other child reacted Mason would run away with the item again. Another example of taunting included Mason pretending to take an item, watching for a reaction from the other child and then taking the item or continued instances of pretending to take the item.

### **Interobserver Agreement**

Interobserver agreement (IOA) is the extent of agreement between observers' scoring of a behavior (Kazdin, 2011). According to Kazdin (2011) there are three primary reasons to assess IOA which are 1) consistency in scoring, 2) the avoidance of researcher bias and prevention of the definition of the behavior from changing, and 3) when there is strong IOA it ensures that the definition for the behavior was well defined (p. 99). The What Works Clearinghouse (WWC) is an organization that has set criteria for determining the efficacy and rigor of experimental designs. According to contributing authors of WWC Kratochwill et al. (2010), researchers conducting SSD need to collect IOA at least 20% of all observations in each phase (Kratochwill et al., 2010, p. 15).

During the present study, IOA was gathered during 100% of activity one baseline observations, 38.5% of activity one intervention observations, and 46.6% of all observations across phases during activity one. IOA was collected during 50% of baseline observations, 40% of intervention observations, and 42.8% of all observations across phases of activity two. IOA was gathered 55.5% of all baseline observations in activity three, 33.3% of intervention observations, and 46.6% of all observations across phases of activity three. For the present study, data for IOA was collected 45% of observations across all activities (one, two, and three) which is above the recommended levels required by the WWC.

In order to assess IOA the researchers utilized frequency ratio. During the observations each researcher used frequency counts for the target behavior. At the end of the observation the frequencies were added by each researcher. In order to compute agreement using frequency ratio the smaller number was then divided by the larger number then multiplied by 100 (See Table 2).

Table 2

*Interobserver Agreement Across Activities*

Activity	OBS. 1	OBS. 2	OBS. 3	OBS. 4	OBS. 5	OBS. 6	OBS. 7	Overall
1	90%	100%	100%	100%	100%	100%	100%	98.6%
2	80%	ND	100%	100%	90%	75%	100%	90.8%
3	94%	95%	100%	100%	96%	100%	100%	97.8%

Note. OBS.= Observation.

There are limitations to using frequency ratios in that although two observers may have high agreement in frequency, they may not have observed the same behaviors at the same time. For example, one observer may have identified five frequencies of a behavior while the other observer also identified five frequencies of the behavior, but they were five different instances of the behavior from the first observer. When a behavior is discrete and clearly defined the likelihood of this occurring is small (Kazdin, 2011). Prior to the present study the researchers practiced IOA before beginning data collection and checked in with each other several times during the observations. These opportunities were utilized to discuss any discrepancies in the recording of observed behaviors.

Table 3

*Pearson Product-Moment Correlation (r) Between the Two Researchers for the Present Study*

<b>Activity</b>	<b>r</b>
1- Snack	+.999
2- Table Toys	+.995
3- Centers	+.998

An additional method for assessing IOA is the Pearson Product-Moment Correlation (r). The Pearson Product-Moment Correlation (r) is used to evaluate IOA over the course of the entire study and it is not effective for analyzing individual observations. Correlation ranges from -1.00 to +1.00. The closer to +1.00, the higher the agreement. A r score of 0 would mean that the scores are unrelated and a -1.00 means



that the observers reported conflicting data, which means that they did not collect data that was similar and therefore the data collection method was not reliable (Kazdin, 2011). The data from the two researchers in this study was input into Excel and the Pearson Product- Moment Correlation function was used to calculate  $r$  for the IOA across observations for the entire study. The  $r$  scores reported for this study indicate that there is a positive correlation between the two researchers' data and that their observations tended to be in agreement (See Table 3).

As a general rule IOA of .80 or 80% or higher has been considered to be acceptable (Kazdin, 2011). The overall IOA for each phase of this study was 97.8% or higher and therefore showed high agreement. It can be assumed that the results of both IOA methods support the assumption that the observers were consistent in recording the target behaviors and that the target behavior was well defined (Kazdin, 2011).

### **Independent Variable**

The Incredible 5-Point Scale (Buron & Curtis, 2012) was used as the independent variable in this study. The scale was designed by Buron and Curtis to be an individualized intervention that can be implemented by families and/or professionals. Moreover, the tool was developed to be used as either a long-term or short-term intervention for an individual with ASD for addressing target behaviors related to social competency. As they continued their work with the scale Buron and Curtis found that it was also effective for individuals with other disabilities such as anxiety disorders and obsessive-compulsive disorders as well (Buron & Curtis, 2012).

Each scale is developed specifically for the individual receiving the intervention. In the present study, a scale was developed for Mason after Ms. McBride identified a

target behavior (inappropriate play towards peers) and the target behavior was clearly defined and separated into five separate observable levels, (level one- independent play, level two- parallel play, level three- collaborative play, level four- play that is not safe and makes peers feel nervous [taunting or taking things from others], and level five- play that is dangerous and needs immediate adult intervention [hitting, kicking, spitting, hurting others])). The visuals used on the tool were then developed based on Mason's interest in superheroes and the tool was implemented using a staggered intervention across the three activities, (activity one- snack time, activity two- table time, and activity three- center time), by the classroom teacher and teacher's assistant over the course of seven weeks.

### **Treatment Fidelity**

Treatment fidelity is an essential component to ensure an intervention is delivered correctly throughout a study. If the intervention is not implemented properly than it can impact the efficacy of said intervention (Kazdin, 2011) and have significant implications to the study. According to Kazdin (2011), treatment fidelity is defined as the "extent to which the intervention is delivered as intended" (p. 194). To ensure treatment fidelity in this study 1) the classroom teacher underwent an hour long training session with the researcher to learn and understand the use and implementation of the scale as well as determine agreement on the targeted behaviors of the participant; 2) The researcher collected data for procedural fidelity during 100% of the intervention observations across all activities; and 3) IOA of procedural fidelity was conducted randomly throughout the study.

Once the scale was developed the researcher met with Ms. McBride to discuss the implementation schedule for activity one. The researcher provided documents to the teacher and walked her through the intervention and implementation processes and schedule. Ms. McBride was given the opportunity to ask any questions that she had regarding the intervention process. Once the training was completed a date was set to begin intervention.

**Figure 9. Protocol for Fidelity Check of the First Day of Intervention**

Did the teacher:	Yes	No
Individually pull the student aside and read the story		
Talk about the story and how the characters in the story: a. Interacted with other characters		
Talk about the story and how the characters in the story: b. Felt when they were behaving throughout the story.		
After the story show the scale to the child. a. Like in our story we feel different emotions when we are behaving in certain ways. This is a level 1 and a level 1 is when I am _____ and I feel _____. Go through all 5 levels referring to the scale each time.		
After the story show the scale to the child. a. What does it look/sound like for you? At a level 1 friends around you feel _____. Go through all 5 levels referring to the scale each time.		
After you show the scale to the child ask prompting questions for understanding. a. What do you look/sound like at level ____? (Go through all levels)		
After you show the scale to the child ask prompting questions for understanding. a. How might our friends feel around you when you are at a level _____?		
Explain that this scale was specially designed for him/her and that you are going to use it to help him/her remember to stay at a level ____ during (activity). a. This story and this scale is only for you. It is a very special tool that you get to use. Isn't that special? When I point to the scale it is because you need to change what you are doing, and this will be your reminder. Let's practice.		
Practice prompting the child with the scale. a. Give certain levels again ask the child at a level 5 what might you be doing?		
Practice prompting the child with the scale. b. Then point to the scale at the ____ level, "oh look! I am pointing, what does that mean? What should your body/voice be doing now?"		
End with the YouTube video of the story.		
Implement the scale Throughout the intervention phase across each activity consistently prompt <i>Mason</i> with the scale as needed.		

A fidelity check protocol was developed in order to ensure that the teacher was following each step of the intervention process for the predetermined time frame. Due to the nature of the study the intervention process looked slightly different across each activity. During the scale's implementation for activity one, the teacher was responsible for teaching the scale to the participant. The fidelity check for day one involved a 12-step implementation process. (See Figure 9). Due to scheduling conflicts the researcher was not able to observe on the first day of intervention. However, the researcher went three days after intervention began and interviewed Ms. McBride to determine if she implemented the 12 steps on the first day of intervention. The interview confirmed that the teacher completed all 12 steps on the initial day of intervention.

**Figure 10. Protocol for Fidelity Check for Days 2-6 of Intervention**

Did the teacher:	Yes	No
Have the child watch the YouTube video		
After the video show the scale to the child ask prompting questions for understanding. a. What do you look/sound like at level ____? (Go through all levels)		
After the video show the scale to the child ask prompting questions for understanding. b. How might our friends feel around you when you are at a level _____?		
Explain that this scale was specially designed for him/her and that you are going to use it to help him/her remember to stay at a level ____ during (activity). This story and this scale <u>is</u> only for you. It is a very special tool that you get to use. Isn't that special? When I point to the scale it is because you need to change what you are doing, and this will be your reminder. Let's practice.		
Practice prompting the child with the scale. a. Give certain levels again ask the child at a level 5 what might you be doing?		
Practice prompting the child with the scale. b. Then point to the scale at the ____ level, "oh look! I am pointing, what does that mean? What should your body/voice be doing now?"		
Implement the scale a. Throughout the intervention phase consistently prompt the child as needed with the scale during appropriate activities. i.e. <i>Mason</i> will be prompted only at Table Time after Activity 2, intervention phase begins		

The intervention implementation process changed for days two through six of intervention (See Figure 10). Rather than 12 steps the fidelity check now involved a seven-step process. On day three of intervention the second researcher observed the classroom and checked fidelity. He noted that Ms. McBride completed six of seven steps. During the fifth day of intervention IOA was taken for the fidelity check and there was 85.7% agreement between observers.

**Figure 11. Protocol for Fidelity Check for Day 7+ of Intervention**

Did the teacher:	Yes
Have the child watch the YouTube video	
Implement the scale a. Throughout the intervention phase consistently prompt the child as needed with the scale during appropriate activities. i.e. <i>Mason</i> will be prompted only at Table Time after Activity 2, intervention phase begins	

The final change to the implementation of the intervention came on day seven throughout the end of the intervention phase across all activities. The intervention implementation steps dropped from seven to two (See Figure 11). On day 10 of the intervention for activity one, the fidelity check indicated that all steps were followed. The following day activity one intervention continued, and activity two intervention began. During this observation an IOA for treatment fidelity was recorded and the researchers were in 100% agreement that both steps were followed. During all subsequent interventions for all activities the two implementation steps were followed by the teacher. Additionally, there were three more observations in which IOA was

documented. During all three observations researchers were in 100% agreement that Ms. McBride followed both steps of the implementation plan.

During the intervention and implementation training Ms. McBride was provided with the three separate fidelity check protocol documents and the process was thoroughly explained to her. Throughout the study she had access to the documents and was observed following the steps on the implementation plan for the intervention. Moreover, through discussion the researcher determined that Ms. McBride was able to consistently follow the research protocol. Mason's behaviors also indicated that he was accustomed to following the protocol; the researcher observed Mason entering the classroom, hanging his coat and backpack, and then going to the computer to listen to the story about the scale. He would either pick up or ask for the book and follow along as he listened to the story. Both Ms. McBride and her teacher's assistant (TA) were observed prompting Mason with the scale as needed and prior to each activity either Ms. McBride or the TA would pull Mason aside with the scale and engage in brief dialogue regarding which level he should remain at throughout the activity. Furthermore, if Ms. McBride had a question she asked for clarification via email, text, or face-to-face when the researcher was in the classroom. Treatment fidelity was maintained throughout the study and IOA was gathered for fidelity on five of 13 intervention days or 38.4% of the data collection days during the intervention phase across activities.

### **Research Design**

This study utilized a multiple-probe SSD across activities for a single participant. Intervention was implemented across three separate activities using a staggered

implementation schedule. The three activities were snack time (activity one), table time (activity two), and circle time (activity three).

Multiple-probe SSD are experimental studies that are intended to determine the effectiveness of an intervention for one or more participants. Multiple probe designs are utilized in instances where the use of “extended baselines (1) may prove reactive, (2) is impractical, and/or (3) a strong *priori* assumption of stability can be made” (Horner & Baer, 1978, pp. 193).

In this case, it was necessary to utilize a multiple probe design as opposed to a continuous, extended multiple-baseline design in order to avoid reactive behaviors for activities two and three over a long implementation and intervention period. Moreover, due to the aggressive nature of Mason’s inappropriate behaviors it was determined that a multiple-probe design would be the most ethical choice for the circumstances and safety of all children in the classroom. Additionally, due to financial and time constraints a continuous baseline design would have been impractical.

## **Procedures**

The procedures followed for the development and implementation of the study will be provided in the following sections.

### **IRB and District Approval**

The RIC IRB process was completed in the spring of 2018. After one resubmission the study was approved. The school selected for this study had a district-wide research and accountability office that was responsible for collecting research proposals prior to any study implementation within the district. The process was similar

to the RIC IRB approval process and took a little over a month to receive final approval once submitted.

## Recruitment and Consent

Figure 12. Target Behavior Identification Document

Participant	Background
<i>Mason</i>	<p>4 y.o.</p> <p>3<sup>rd</sup> year of PK in this classroom</p> <p>Developmental Delay- Speech, OT</p> <p>Only child, a lot of cousins around the same age.</p> <p>Just started talking last year. (Communication)</p> <p>Starting to stutter- visit with doctor said it's behavioral.</p>
Interests	Behavior and Definition
Spiderman and other superheroes	<p><b>Inappropriate Play with Peers:</b> Inappropriate play with peers is defined as a child behaving in either a physically or emotionally aggressive manner. This looks like hitting, spitting, and kicking others or taking things from other children whether it be toys, tools, and other objects, or taunting other children.</p> <p>5- Takes things from other children and hits them. Spitting, hitting, kicking.</p> <p>4- Taunts others or takes things from others (toys, seats, etc.) and runs away with item(s) or refusal to move (from seat).</p> <p>3- Cooperatively playing with others. Using words to get the things he wants.</p> <p>2- Parallel play.</p> <p>1-Plays independently.</p>
Where on Scale	Where Should be on Scale
4	3

Figure 12. Researcher developed document for identifying Mason's target behavior for the present study.

After district approval to conduct the study was received the researcher was permitted to begin recruiting teachers. Three teachers who were past students of the



researcher were initially contacted via email by the researcher's major professor. The major professor sent the recruitment emails in order to avoid the possibility of coercion. Two of the three teachers had switched jobs; one was now in a position that she would no longer be in a classroom setting and the other in a different teaching role. Therefore, they were not interested in participating in this study. However, Ms. McBride responded that she was interested in participating in the present study; at that point it was acceptable for the researcher to contact her.

Once Ms. McBride responded, the researcher emailed her to thank her for her interest in participating in the present study, to determine a date and time to have an initial meeting, and to provide her with the district study approval document. The document was also shared with her building principal who verbally approved the present study at the building level. The initial meeting was held the same week.

During the initial meeting, the researcher provided Ms. McBride with a folder of information regarding the study. The folder contained a teacher recruitment flier and consent form, parent recruitment fliers and consent forms (in both English and Spanish, developed by a native Spanish speaker), and samples of the Incredible 5-Point Scale. During the meeting the purpose of the study was discussed and what that would mean for her as the classroom teacher. The researcher explained how the scale would work and asked if the teacher thought she had any students that could benefit from the study. Ms. McBride responded that she did have students this study may benefit and that she would reach out to the appropriate families the following week. At the end of the meeting the researcher asked Ms. McBride to read the teacher consent form to ensure she was

interested in the study. The researcher planned to collect the form from the teacher at the next meeting.

The following week Ms. McBride sought out the families of children she selected for the study and provided them with recruitment fliers. She collected the signed recruitment fliers and when the researcher met with her next, they discussed getting signed consent from the families whom indicated an interest in participating in this study. The teacher distributed and collected signed consent forms. The next time the researcher went to the school she gathered the signed consent forms and sat with *Ms. McBride* for about one hour and a half to clearly identify and define the target behaviors that would be addressed during the present study (See Figure 12). This information was used to clearly define the target behavior and was the premise of the observations and the development of the scale for Mason.

When the researcher went to the classroom to collect the signed consent forms, after her meeting with Ms. McBride, the researcher stayed and observed the participants. She utilized this time to familiarize herself with three of the five participants (two of the participants [Ivan and Matheus]) were absent). She also used the time to ask clarifying questions regarding the specified target behaviors. During the next visit both researchers were present and data collection for this study began.

### **Data Collection**

In order to record data for this study, the researcher developed a data collection document which included the observation date, start and end time, frequency of target behavior, and notes for each activity and participant. This format was utilized by both researchers for all consecutive observations. Data collection occurred during specified

activities within the classroom dependent upon the participants' identified target behaviors and the teacher identified activities in which the behaviors were occurring. Data was recorded for Ivan and Mason during snack time (activity one), table toys time (activity two), and center time (activity three). Data was collected for Leo, Thiago, and Matheus during first circle. Each activity had an established routine and behavior expectations. It is important to note that this study began as three separate studies with five possible participants. However, after observations it was determined that two of the studies would end due to extinction of behaviors or lack of evidence for specified target behaviors. While the researcher describes the five participants, the present study was conducted only with the fifth participant, Mason.

The opening activity for the afternoon was table toys. During table toys time, data was recorded for Ivan and Mason. The researcher(s) observed the participants for the entirety of table time maintaining a close proximity in order to observe any target behaviors as they occurred. The data collection instrument was used; the start and end time of the activity was recorded as well as the frequency of the target behavior. Children were assigned to table one, two, or three and completed whichever activity was set out (crafts, puzzles, board games, bristle blocks, Legos, etc.) for the day. A timer was set, and the students stayed at each table for 10 before cleaning up and moving on to circle time.

During circle time, students were expected to find a square on the classroom rug and sit without touching other children. They were asked to listen to the teacher and other children as they spoke and raise their hands when they wanted to speak. Leo, Thiago, and Matheus were observed during this activity. The researcher(s) observed the

participants for the entirety of circle time sitting behind the students, in chairs, while maintaining close proximity in order to observe any target behaviors that occurred during the activity. The data collection instrument was used; the start and end time of the activity was recorded as well as the frequency of the target behavior for each participant. At the start of the study students transitioned from table time to circle time with a movement activity which consisted of a song and dance. After the third observation the teacher changed the routine by discontinuing the song and dance which significantly impacted student behaviors. Following first circle, students had snack time.

During snack time students were asked to wash their hands, select a snack (which generally consisted of a juice and milk and a variety of foods including fruits, cereal bars, animal crackers, etc.), and then sit at a table with their classmates to eat their snacks. During snack time data was collected on Ivan and Mason. The researcher(s) observed the participants for the entirety of snack time sitting or standing within close proximity in order to observe any target behaviors as they occurred. The data collection instrument was used for each participant separately; the start and end time of the activity was recorded as well as the frequency of the target behavior for the duration of snack. Center time was scheduled after students had snack and read a book.

Center time offered students autonomy within the classroom to select different peers to interact with and activities to play (dramatic play, blocks, games, etc.). Each center had a designated number of children allowed to participate in the space. Children were expected to share materials and had specific rules for different centers within the classroom. For example, in the block area, if a child built a tower, that child was the only person allowed to knock it over, unless permission was given by the child who was the

builder to another child in the classroom. Data was collected on Ivan and Mason throughout center time. During center time, the researcher(s) observed the participants for an average of 20 minutes.

Due to the dynamics of center time, the researchers had to navigate the classroom to maintain close proximity to the participants in order to observe any target behaviors while staying out of the way of the free flow of the classroom environment. The data collection instrument was used for each participant separately; the start and end time of the activity was recorded as well as the frequency of the target behavior for both Mason and Ivan. After data collection ceased during center time, the observation was completed, and the researcher(s) left for the day or spoke with the teacher. On days that both researchers were collecting data they spoke with one another about the observation, any next steps, and clarified any discrepancies in the reporting of the data. Again, it is important to mention that while five students were initially selected for the study and baseline data was gathered for all five individuals due to changes in the classroom and observations of the defined target behaviors the full study was solely conducted with Mason.

After the final day of data collection an email was sent to the teacher with an attached survey to determine her overall feelings regarding the implementation of the scale (social validity assessment). She returned the completed scale. Maintenance for this study will be performed at one and three months.

### **Baseline Data**

In multiple-probe, SSD there are specific requirements for proper baseline data collection. According to Horner and Baer (1978), the following three requirements

should be met when gathering baseline data in a multiple probe design (1) each baseline should have an initial probe; (2) each baseline should have a probe once stabilization has occurred in any phase receiving intervention; (3) a series of probes that increases by one session for each phase should be recorded before the independent variable is introduced to a phase (p. 190).

In the present study, baseline data for activity one was gathered for two days. Typically, baseline data should be gathered for three days or probes, but an exception is made in instances such as the present study when the target behaviors are potentially harmful to others, in that case baseline data probes can be decreased. The target behaviors exhibited by Mason were potentially harmful to himself and others, therefore, only two baseline probes for activity one were collected.

Multiple probe SSD requires that baseline collection increases by one probe for each activity. Therefore, the researcher observed and recorded three baseline probes for activity two. The first probe was on the same day as the first probe for activity one, the second probe for activity two was collected when trend began for activity one, and then one additional baseline probe was gathered before intervention began for activity two.

There were seven baseline probes recorded for activity three. The first probe was collected at the same time that the first probes for activities one and two were recorded. The second probe for activity three was recorded on the second observation day and final baseline day for activity one. The third probe was collected when activity one started trend. The fourth probe was recorded when intervention began for activity two. The fifth probe was recorded on the next visit and the sixth and seventh probes were collected once a stable trend occurred during activity two.

## Creating the Intervention

In order to create the intervention, the researcher met with the teacher to develop a concrete definition of the target behavior (inappropriate play with peers). Once a definition was determined then the behavior was broken down into five separate levels by determining specific and observable behaviors and characteristics of each level for the scale. (See Table 4).

Table 4

*Specific Characteristics Associated with Mason's Target Behavior*

Level	Characteristics
5	Takes things from another child and hits him/her. Spitting, hitting, kicking.
4	Takes things from others (toys, seats, etc.) and runs away.
3	Cooperatively playing with others. Using words to get the things he wants.
2	Parallel play.
1	Plays independently.

*Note.* Characteristics= specific characteristics associated with Mason's target behavior. Characteristics are observable, i.e. what does the behavior look or sound like.

Once the target behaviors were identified the researcher began to collect baseline data, this provided the opportunity to clarify any questions regarding the identified behaviors. After the second observation the scale was developed (See Figure 13). Mason was interested in superheroes, so the researcher utilized Clipart to include pictures on the scale that would be appealing to Mason. Buron and Curtis (2012) recommend using stories or videos to teach individuals about the scale. Therefore, the researcher developed

a story and created a YouTube video with the story for Mason to watch and use as a tool to learn the scale. (The story can be listened to here:

<https://www.youtube.com/watch?v=n0FIzprSaRw&t=57s>).

Figure 13. **Mason's Incredible 5-Point Scale**

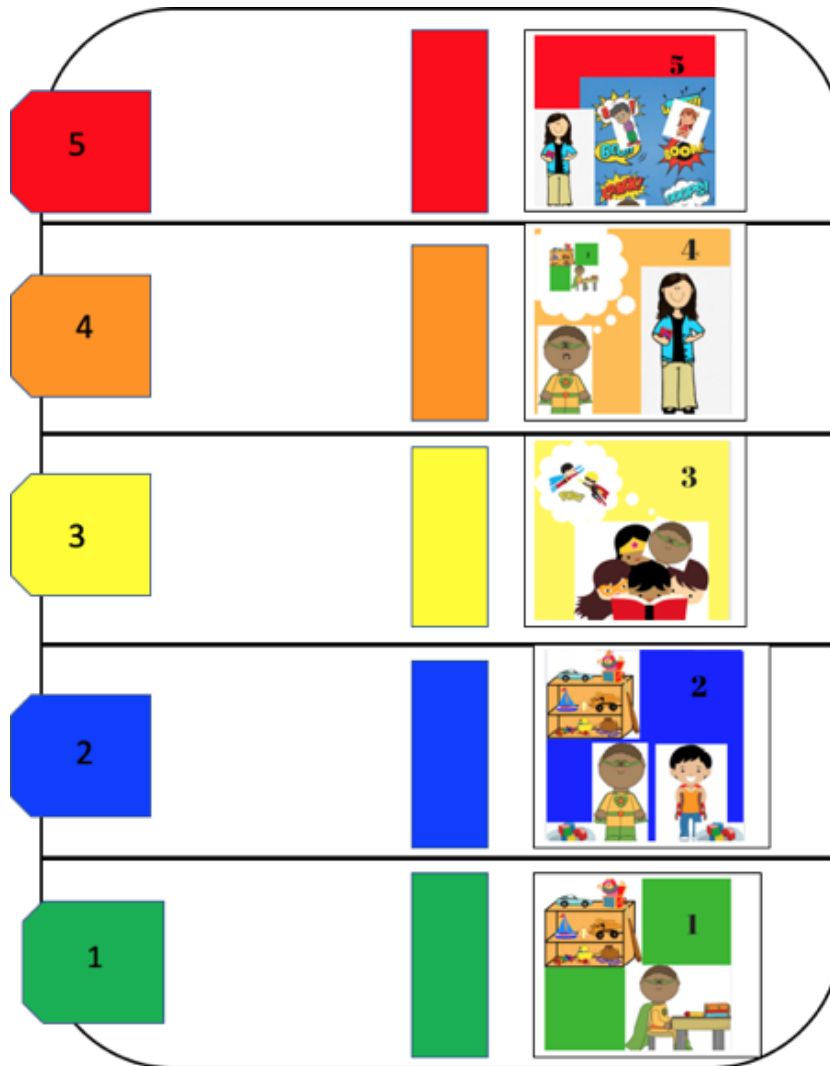


Figure 13. Researcher developed Incredible 5-Point Scale for Mason's target behavior. Clipart images retrieved from <https://www.mycutegraphics.com/graphics/superhero-images.html> and <http://clipart-library.com/teacher-speaking-cliparts.html>



In addition to the story and the original scale, a small portable flip scale was created. The flip scale was made up of small prompting cards that were small versions of the different levels represented on the scale and were used to prompt and reinforce behaviors (see Figure 14). According to Buron and Curtis (2012), using a small portable scale is beneficial because it can be with a person at all times. In this study the portable scale was not carried at all times, but it was easily accessible and could be placed in front of Mason while he worked.

Figure 14. **Mason's Flip Scale**



Figure 14. Researcher developed Incredible 5-Point Scale flip scale for Mason's target behavior. Clipart images retrieved from <https://www.mycutegraphics.com/graphics/superhero-images.html> and <http://clipart-library.com/teacher-speaking-cliparts.html>

In short, the scale was developed and utilized in three separate formats, the full scale, a story, and a portable flip scale. Each format of the scale was developed for ease of use or to teach the scale to Mason. Furthermore, each format was a recommended practice from the authors of the Incredible 5-Point Scale (Burton & Curtis, 2012).

### **Implementation of the Staggered Intervention Over Time**

From the beginning of the district proposal process until the end of the intervention data collection across all three activities the present study took 17 weeks. The baseline and intervention data collection across all three activities took seven weeks (See Appendix E). Baseline data collection across all three activities began on the same day.

Two baseline probes were collected for activity one. Due to the safety risk of Mason's aggressive behaviors rather than waiting for three baseline probes the researcher determined that ethically the intervention should begin after two probes. After an interview with Ms. McBride regarding Mason's target behavior over the previous two years of preschool and once there was baseline evidence of the presence of the target behavior an a priori assumption was made that the target behavior was present, pervasive, and stable; therefore, intervention was implemented for activity one.

Due to scheduling conflicts and a holiday, neither researcher was able to gather data the first day of the intervention implementation for activity one. On the third day of intervention the first researcher went to the school to collect data however, Mason was absent, so the researcher interviewed Ms. McBride to check for fidelity of the first day of intervention. The following week, on the fifth day of activity one intervention, the second researcher was able to gather intervention data and conduct a procedural fidelity

check. That same week, on the seventh day of intervention (activity one) both researchers attended the observation and recorded data on the intervention, completed procedural fidelity checks, gathered baseline probes for activities two and three, and recorded data for IOA.

Activity one intervention continued for 10 days. During that time there were three observations of activity one and two observations of activities two and three. In multiple-probe designs a staggered implementation for intervention is essential as it is the experimental control of the study (Horner & Baer, 1978; Kazdin, 2011; Murphy & Bryan, 2001). As the intervention is implemented during one activity and baseline data collection continues in the other activities it is anticipated that behaviors will stay the same in the two activities still in the baseline phase of the study; meanwhile, it is expected that the behaviors will change in the activity receiving the intervention. If the behavior changes across all activities or does not change in the activity receiving the intervention it can be assumed that the intervention is not having the intended effect or there is carryover of the intervention across the activities. Therefore, when the intervention for activity one began, baseline data continued to be collected for activities two and three. In order to begin intervention in subsequent activities target behaviors need to be stable in the activity(ies) which intervention is already implemented (Horner & Baer, 1978). A stable trend was identified during the second and third intervention observations and on the 11<sup>th</sup> day of activity one intervention, activity two intervention was implemented.

When activity two intervention implementation occurred activity one intervention continued and procedural fidelity checks were made for activities one and two, baseline

data was gathered for activity three, and both researchers recorded IOA data. Activity one maintained a stable trend and on the 10<sup>th</sup> day of the intervention phase of activity two a stable trend was met. Therefore, activity three intervention was implemented.

On the first day of intervention for activity three both researchers attended the observation in order to record IOA data. Data were also gathered for procedural fidelity during all three activities. A second observation was made during this week. Intervention data and procedural fidelity checks were collected across all three activities. Once activity three intervention was implemented data were collected across all three activities of intervention for six days. As required by SSD, data collection ended at the same time for all activities (Kazdin, 2011; Krishef, 1991).

In a multiple-probe design, intervention implementation is dependent upon a stable baseline being met prior to the implementation of the intervention (Horner & Baer, 1978; Kazdin, 2011; Murphy & Bryan, 2001). Additionally, baseline begins at the same time across activities of the study. Once intervention has been implemented for an activity each consecutive activity should have at least one additional baseline probe. For example, if activity one has one probe then activity two should have at minimum two probes, and so on. Activity one of this study has two recorded baseline probes, activity two has three, and activity three has seven recorded probes. After the intervention was implemented in activity one and a trend was established intervention began for activity two. In order to be valid as an experimental design the interventions had to be staggered as each activity acted as a control for the study and the efficacy of the intervention (Kazdin, 2011; Krishef, 1991; Murphy and Bryan, 2001).

### **Data Analysis**

The research question (To what extent does the implementation of the Incredible 5-Point Scale impact target behaviors of preschool children with Developmental Delays?) was answered by gathering baseline data across three separate activities and utilizing a staggered implementation of the intervention across the three activities. The frequency of the target behavior was recorded during the observations and then calculated into a rate per minute (RPM) of observed target behavior. RPM was then input into Microsoft Excel and a line graph was developed to conduct a visual analysis.

In order to analyze the data, the researcher utilized three methods of analysis common to SSD. The first method of analysis was visual analysis, the second was percentage of nonoverlapping data (PND), and the third was percentage of data exceeding the median (PEM). PND and PEM provided the researcher with an effect size to determine to what extent the intervention impacted Mason's target behavior (inappropriate play with peers). As a general rule, in order to show efficacy as an intervention the effect size should be at a minimum of .80. An effect size of .90 or higher indicates that an intervention is highly effective, whereas an effect size below .50 is considered to be ineffective (Lenz, 2013).

Visual analysis has historically been the primary data analysis method utilized in SSD research (Kazdin, 2011) and was utilized in this study. When incorporating visual analysis into a study, researchers consider the data patterns between phases and across activities then identify whether or not the target behavior changes once intervention has been implemented (Kazdin, 2011). While performing the visual analysis for the present study, the researcher considered the difference between the mean of each baseline and intervention phases across the three activities and then identified if there was a change in

level between the baseline and intervention phases of each activity. Level is identified by the researcher by looking at the final datum point of the baseline phase and the first datum point of the intervention phase and determining whether or not there was a visible shift between the baseline and intervention phases (Kazdin, 2011). Trend and latency were also considered in the visual inspection of the data. When determining trend, the researcher looked for an increase or decrease in behavior over time. Latency on the other hand was determined by how quickly changes occurred after the intervention was implemented (Kazdin, 2011).

The second method of data analysis used in this study was the percentage of nonoverlapping data (PND). PND considers the baseline datum closest to the anticipated trend and then the number of treatment phase data points either under or over the baseline datum point (dependent upon anticipated trend) is divided by the total number of data points in the treatment phase. Once computed, the researcher has an effect size calculation and is able to determine whether or not the intervention was effective. However, using PND has a limitation in that if the baseline data set has an outlier relatively closer to the anticipated intervention trend compared to all other baseline data points the results may have a type II error, meaning the effect size may indicate no effect when there actually was an intervention effect (Lenz, 2013).

The third and final data analysis method utilized in this study was percentage of data exceeding the median (PEM). PEM calculates the median baseline datum point and then calculates how many data points in the intervention phase overlap with the median datum point. PEM provides the researcher with an effect size and is frequently used when there are outliers in the baseline data which could impact the results of the study (Lenz,

2013). In activity two of this study there is an outlier in the baseline data therefore, PEM was selected in order to avoid a type II error that may be present in the PND analysis. According to Lenz (2013) there are five specific steps that the researcher must follow in order to calculate PEM. The first step is to determine whether the intended change will increase or decrease data points between baseline and treatment. The second step is to find the median baseline phase datum point. The third step is to draw a line from the median datum point, and it extend it through the treatment phase. The fourth step is to count how many data points in the treatment phase are above or below the median (whether the data points counted are above or below the line is dependent upon intended change of behavior after intervention [i.e., if the anticipation was that behaviors would decrease the researcher would count any data points below baseline median datum point]). The fifth step is to divide the number found in step four by the total number of treatment phase data points (Lenz, 2013, p. 70). PEM is fairly easy to calculate however it is subject to Type I errors, meaning that the effect size could indicate that there was a change with intervention when there actually was not.

### **Internal Validity**

According to Horner et al. (2005), “Single-Subject research designs provide experimental control for most threats to internal validity and, thereby, allow confirmation of functional relationship between manipulation of the independent variable and change in the dependent variable” (p.168). Within SSD there are eight primary threats to internal validity. The threats and procedures implemented in this study to protect the internal threat to validity are included in Figure 15. The assessment of maintenance following the treatment protocol will be an added check to internal validity.

Figure 15. **How the Present Study Avoided Threats to Internal Validity**

Threats to internal validity (Kazdin, 1982, p. 78)	Procedures to avoid these threats
History	One of the screening questions with the teacher was as we discussed participants was whether or not any of them had experience with The Incredible 5-Point Scale. She said that they had not had experience.
Maturation	Data collection with <i>Mason</i> lasted for 26 days, therefore, the possibility of maturation was decreased.
Testing	All observations were unobtrusive. According to the teacher in the follow-up survey at the end of the study the researchers took data without the participant or other students realizing what was going on.
Instrumentation	The data collection tool remained the same, it provided a place for the researchers to indicate the date, time for the observation, and tally for frequency of behavior.
Statistical Regression	Statistical regression was avoided through the use of a multiple-probe design and staggered implementation of the intervention.
Selection Biases	Students were selected using subjective evaluation, which uses the expertise of the classroom teacher to determine the students that could benefit from an intervention.
Attrition	In order to ensure that a study was completed the researcher started with several studies and participants. The study concluded with one participant who remained a part of the study from start to finish. No other participants were a part of this study, rather they would have been a part of one of two additional studies that did not extend past the baseline phase.
Diffusion of Treatment	This design does not remove treatment as a means for assessment, therefore this threat to internal validity can be ruled out.

## External Validity

In SSD, “External validity of results from single-subject research is enhanced through replication of the effects across different participants different conditions, and/or different measures of the dependent variable” (Horner et al., 2005, p. 171). In the present study the participant was a preschool-aged child with DD. Per multiple- probe design, effects across activities were documented. Due to the small sample size in SSD, attrition is a significant threat to external validity (Horner et al., 2005). In order to avoid attrition



in this study the researcher started gathering data for three separate but similarly designed studies. One study came to fruition. While a limitation can be seen in the sample size, to assist readers in determining if the sample is representative of and transferrable to their student population the researcher provided a description of the participant and his demographics, a detailed description of the school and classroom settings, and an observable, concrete, and specific definition of the target behavior and the levels of the target behavior exhibited by the participant.

### **Social Validity**

According to Kazdin (2011) social validity is designed to ensure that interventions take into consideration the concerns of society. In order to do this social validity should answer three questions, (1) Are the goals of the interventions relevant; (2) Are the intervention procedures acceptable to consumers and to the community at large; (3) Are the outcomes of the intervention important, that is, do the changes make a difference in the everyday lives of individuals (Kazdin, 2011)? The method of social validation that was used in the present study was subjective evaluation. Subjective evaluation is a method of social validation used in single subject design which relies on the opinions of individuals who have expertise and/or familiarity of an individual, in this case the teacher, and are in a position which allows them to make a decision regarding the behaviors of an individual (Kazdin, 2011).

The first social validation occurred in the selection process of the five preschool aged participants whom exhibited identifiable, target behaviors. The participants were selected using the subjective evaluation method in that the target behaviors were determined by the teacher through her own observations per normal classroom

procedures. The target behaviors ranged from using a loud voice in the classroom, to taunting and teasing peers, or engaging in harmful behaviors such as hitting, pushing, or kicking. The identified target behaviors of each participant determined to which study they would be assigned. After the observations began two studies were discontinued. The first study was discontinued after changes were made to the classroom routine and a discussion between the researcher and teacher determined that three participants (Leo, Matheus, and Thiago) were no longer eligible for the study as they no longer exhibited the identified target behavior. The second study was discontinued after it was determined that the voice volume of the participant (Ivan) mimicked that of the classroom norm. The third study continued from start to finish with the fifth participant (Mason).

The second social validation used was a short questionnaire which was provided to the teacher electronically at the end of the study to solicit her opinions on the process and impact of the study on Mason and herself as the individual implementing the scale. The questionnaire included 8 Likert scale items ranging from strongly disagree to strongly agree and 4 short answer questions. The teacher's responses can be found in Appendix F.

### **Chapter Summary**

Chapter Three addressed the many components of methodology for this study. The research question, participants, setting, research design and procedures, as well as data analysis and social validity were addressed. The CEC standards for rigorous SSD design were considered and incorporated into the development of the present study.

## Chapter IV. RESULTS

### Introduction

Chapter Four will explore the results of the present study. Data regarding the visual analysis, PND, and PEM across all three activities will be provided. Additionally, the responses provided by Ms. McBride in the social validity questionnaire will be shared. The chapter will conclude with a summary of the results.

### Research Question

This study utilized a multiple-probe single subject design with one participant, *Mason*, across activities (snack time, table toy time, and center time) to answer the research question: *To what extent does the implementation of the Incredible 5-Point Scale impact target behaviors of preschool children with Developmental Delays?*

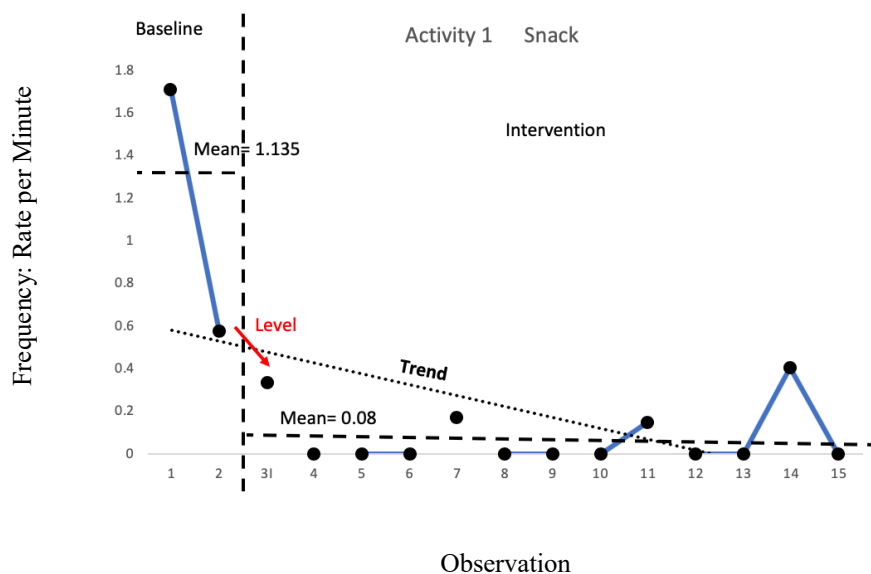
### Results of Visual Analysis

**Activity one.** Upon visual inspection of activity one data, the researcher was able to determine that the intervention had an immediate impact on the participant's behaviors. Although there was a decline in the dependent variable during the baseline phase of activity one and slight variability in target behaviors during the intervention phase (range= 0- 0.4 RPM), there were no overlapping data points between baseline (range= 0.57- 1.7 RPM) and intervention. Figure 16 provides a graphic representation of the data between baseline and intervention during activity one. The red arrow on Figure 16 indicates the level of change between baseline and intervention. Based on the analysis of the final datum point in baseline (0.57 RPM) and the first datum point in intervention (0.33 RPM) there was an immediate negative shift or decrease in the level of the target behavior which provides evidence that the intervention had an effect on the dependent

variable. Moreover, the immediate drop in behavior indicates a short latency change between baseline and intervention.

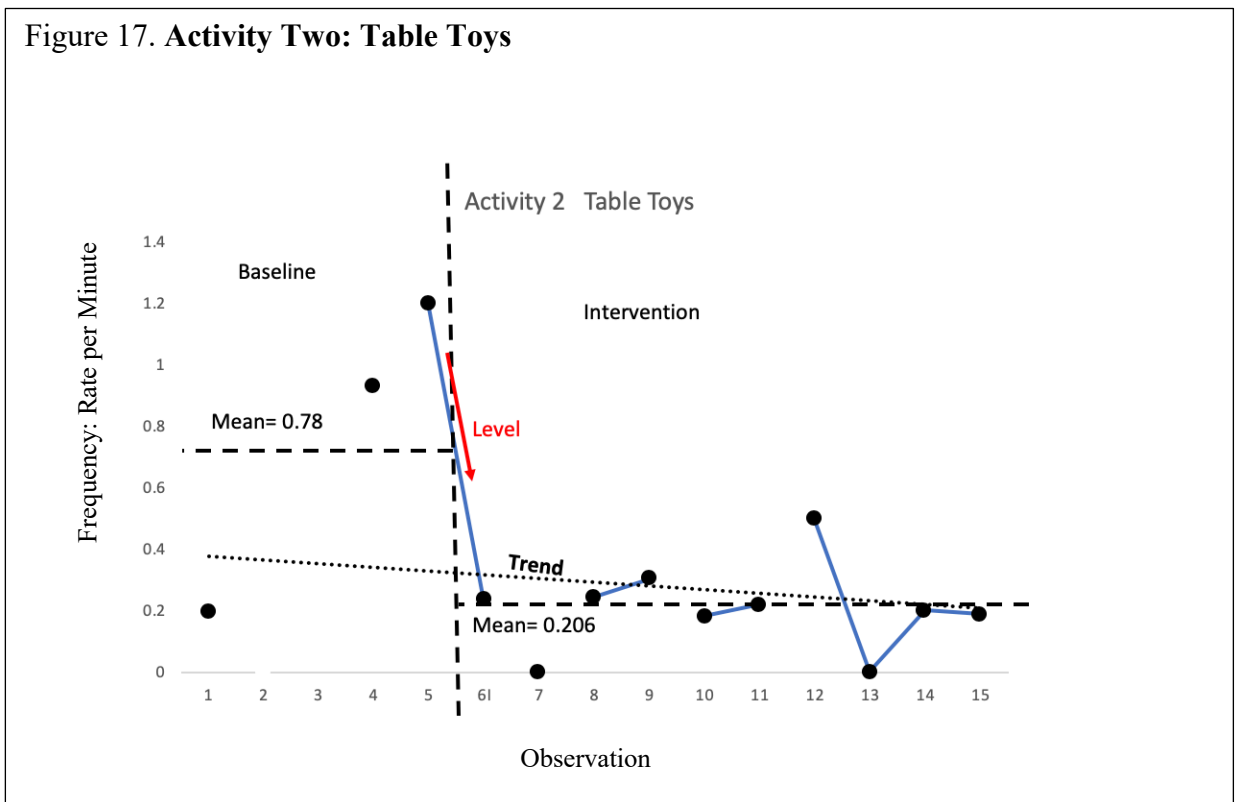
A regression line across baseline and intervention data with negative slope indicates that the target behavior continued to decrease throughout the study. Additionally, the means ( $\bar{x}$ ) for baseline and intervention behaviors were calculated  $\bar{x} = 1.135$  RPM (range= 0.57- 1.7 RPM) and  $\bar{x} = 0.08$  RPM (range= 0- 0.4 RPM) respectively. When the difference between means was computed there was a decrease of 1.055 RPM from baseline to intervention, indicating that the intervention had the intended effect of decreasing target behaviors.

Figure 16. Activity One: Snack



**Activity 2.** Visual inspection of activity two data indicated that the intervention had an immediate impact on *Mason's* target behavior as the dependent variable decreased immediately upon implementation of the intervention. While one datum point overlapped significantly with several intervention data points, further analysis of the baseline data

shows an increasing trend up prior to intervention indicating that the initial probe may have been an outlier. Figure 17 provides a graphic representation of the data between baseline and intervention during activity two. The red arrow on Figure 17 indicates the level of change between baseline and intervention. Based on the analysis of the final datum point in baseline (1.20 RPM) and the first datum point in intervention (0.235 RPM) there was an immediate negative shift or decrease in the level of the dependent variable, the immediate drop in behavior is indicative of a short latency change in the behavior between baseline and intervention.



The range for activity two baseline data was 0.2- 1.2 and the range for intervention was 0- 0.5. All data points were analyzed to calculate m for activity two in each phase. Activity two baseline data was  $\bar{X} = 0.78$ , this was higher than the largest

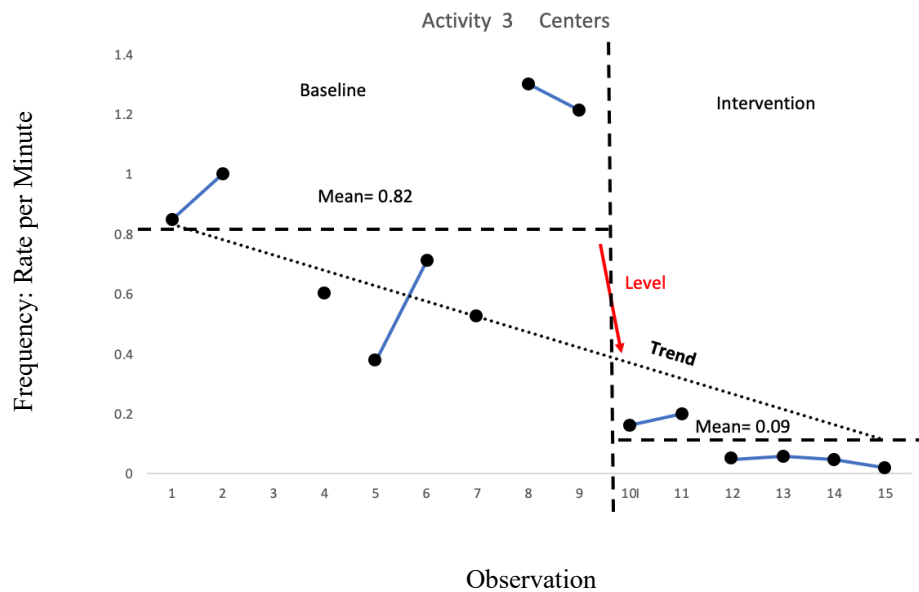
datum point during intervention (0.5) and the  $\bar{x}$  for intervention ( $\bar{x}=0.206$ ). Given this, despite the outlier, this indicates that there was a decrease in target behavior between baseline and intervention phases. Finally, a regression line across baseline and intervention data with negative slope indicates that the dependent variable continued to decrease throughout the study. The visual analysis of activity two provides evidence that despite the outlier in the baseline phase the intervention had the intended effect of decreasing *Mason's* target behaviors (see Figure 17).

**Activity 3.** After the visual inspection of activity three baseline and intervention data, the researcher was able to determine that the intervention had an immediate impact on *Mason's* target behavior. Baseline data indicated some variability (range= 0.38-1.217) however, once intervention started the dependent variable decreased immediately and shared zero overlap between phases. During the intervention phase the RPM for target behavior continued to decrease (range=0 .02- 0.16). A regression line with negative slope across baseline and intervention data indicates that the target behavior continued to decrease throughout the intervention phase of the present study. Figure 18 provides a graphic representation of the data between baseline and intervention during activity three.

Analysis of the final datum point in baseline (1.217 RPM) and the first datum point in intervention (0.16 RPM) indicated an immediate negative shift in the level (represented by the red arrow) of the target behavior RPM, the immediate drop in behavior is indicative of a short latency change in the behavior between baseline and intervention (see Figure 18). The mean ( $\bar{x}$ ) for target behaviors during baseline ( $\bar{x} = 0.8$  RPM) and target behaviors during intervention ( $\bar{x} = 0.09$  RPM) were calculated and then

the difference between means was computed which resulted in a decrease of .71 RPM from baseline to intervention, indicating that the intervention had the intended effect of decreasing Mason's target behaviors.

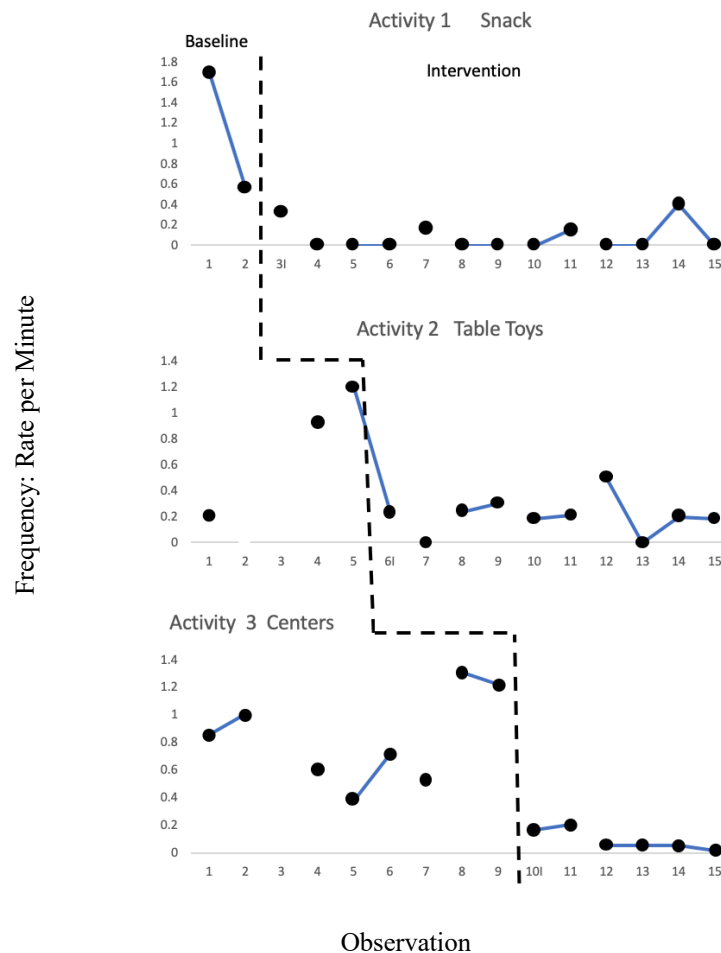
Figure 18. Activity Three: Centers



### Summary of the Visual Analysis

A visual analysis across all three activities provides a strong indication of the intervention's effectiveness. There is no indication of intervention carry-over effects between activities as Mason's target behaviors continued to remain mostly stable across activities until intervention began. Analysis of Figure 19 indicates immediate negative shifts in level between baseline and intervention phases across activities.

Figure 19. Mason's Inappropriate Play Across Three Activities



### Results of Percentage of Nonoverlapping Data

Mean PND calculations to analyze the impact of the Incredible 5-Point Scale on Mason's target behavior (inappropriate play with others) were computed for each intervention phase across the three activities. The effect size for activities one and three were each calculated as +1 (100%) which indicates that the independent variable was highly effective. However, activity two computed at +.4 (40%) which indicates that the intervention was ineffective. According to Lenz (2013) to show efficacy as an intervention the effect size should be at a minimum of .80. An effect size of .50 or lower



is considered to be ineffective whereas an effect size of .90 or higher is considered highly effective (Lenz, 2013). The researcher calculated the mean PND of all the intervention phases across all three activities resulting in a  $\bar{x}$  PND of +.80 (80%). A .80 or 80% indicates that overall the scale was an effective intervention (Lenz, 2013; See Figure 20).

Figure 20. PND Across all Activities

Activity	Baseline Datum		#Nonoverlapping data points in Intervention Total in intervention		PND
1 (Snack)	.57		13/13		1
2 (Table Toys)	.2		4/10		.4
3 (Center)	.38		6/6		1
Activity	1	2	3	PND/3	m of PND
PND	1	.4	1	2.4/3	.80

### Results of Percentage of Data Exceeding the Median

The final method of analysis used in this study was PEM. PEM was computed to determine the effect size of the intervention on the target behavior across all activities of the study. After computing the median baseline datum point for each activity, the researcher then calculated each corresponding effect size. All activities reported an effect size of +1 (100%) which indicates that the independent variable was highly effective for each intervention phase across all three activities (See Figure 21).

Figure 21. **PEM Across all Activities**

Activity	Median Baseline Datum Point	<u>#Nonoverlapping data points in Intervention</u> Total in intervention	PEM
1 (Snack)	1.135	13/13	1
2 (Table Toys)	.93	10/10	1
3 (Center)	.78	6/6	1

### **Social Validity**

The questionnaire provided to Ms. McBride included eight Likert scale items ranging from strongly disagree to strongly agree and four short answer questions. Overall, her responses indicated that she agreed that her student's behavior improved; the intervention was effective; that she could accurately implement the scale in her classroom; and that the time required to implement the scale was reasonable. She strongly agreed that the changes she observed in her student were socially important; she understood the intervention steps for the Incredible 5-Point Scale; the scale was easily incorporated into her classroom; and that she had the necessary materials to implement the scale.

The short answer questions provided a richer look at Ms. McBride's opinions on the overall study and effectiveness of the scale for her student. The questions were designed to understand how Ms. McBride perceived the development and

implementation of the scale in her classroom, including the impact on Mason's behaviors. The first question asked about her thoughts and opinions regarding the purpose of the study. She replied that the study was helpful within her classroom and that it "not only helped change the behavior of one of our students but having the research team in the classroom helped us ensure we were using the scale correctly and with consistency" (Ms. McBride, personal communication, January 4, 2019). The second short answer question asked about the cost effectiveness of the tool, the teacher believed the tool to be cost effective and easy to develop. In response to the third question regarding ease of use the teacher responded that "visuals assisted in the ease of the procedure and was matched to the interest of our student" (Ms. McBride, personal communication, January 4, 2019). She went on to say that "The small visuals made it easy to check in before each activity and to hold up as reminders if needed. The student was able to understand the scale easily and followed along with ease" (Ms. McBride, personal communication, January 4, 2019). The fourth question asked for the teacher to provide any additional information regarding the scale or study overall. She responded that the overall experience for her was positive in that the research team became a part of the classroom and was able to observe without disrupting the class. She also mentioned the collaboration between the researcher and herself in developing the scale and that it made the scale development easy. However, Ms. McBride also thought she may have difficulty developing the scale independently but intends to practice and incorporate this intervention in additional contexts within her classroom.

## **Chapter Summary**

The three methods of data analysis conducted for this study were visual analysis, PND, and PEM. During visual analysis the researcher considered the mean of the baseline and intervention phases, and then compared the difference between the means to determine what if any change in target behavior occurred between baseline and intervention phases across activities. Level, trend, and latency were also analyzed which provided an indication for the effectiveness of the intervention. Next, the researcher conducted an analysis using PND which provided a statistical analysis to consider the results across activities. Then, the researcher conducted an analysis using PEM which provided a slightly different statistical outcome for activity two from that of the results from PND. However, activity one and activity three remained consistent in that they both remained highly effective from one statistical analysis to the other. Finally, the researcher used a questionnaire to determine the social validity of the scale. Taken altogether, the data provided evidence of a functional relationship between the independent variable and the dependent variable which resulted in a meaningful change in the target behavior during intervention. Furthermore, the questionnaire provided insight to Ms. McBride's perceptions of the scale's efficacy and ease of use.

## **Chapter V. DISCUSSION**

### **Introduction**

Chapter Five includes a discussion of the results of the study. Limitations will be discussed as well as implications for current professionals and future research.

### **What this Study Tells Us About the Incredible 5-Point Scale**

Results of this experimental design suggest that the Incredible 5-Point Scale may be an effective tool for modifying target behaviors of preschool-aged children with DD. Visual analysis determined that although there was some variability in Mason's behaviors throughout both baseline and intervention phases that the frequency as calculated by rate per minute decreased immediately following implementation of the intervention across all three activities. Furthermore, linear regression presented in the visual analysis was evidence of a negative slope which indicated a decrease in target behaviors. Mean scores across baseline and intervention across all three activities had zero overlapping data points. One concern in the visual analysis was an outlier identified in activity two that overlapped in six out of 10 data points in the intervention phase. However, change in mean, level, and linear regression supported the efficacy of the intervention despite the outlier in the baseline phase.

PND, a statistical analysis used in the present study, measures the effect size of an intervention by determining the baseline datum point closest to the intended effect of intervention and how many overlapping data points during the intervention phase are recorded. Activities one and three both indicated that the scale had a high level of effectiveness (+1 or 100%). However, when PND was calculated for activity two, the result was .40 or 40%. Anything below .5 or 50% is considered to be ineffective (Lenz,

2013). One concern in using PND is the possibility of a type II error occurring, meaning there was a failure to reject a false null (Field, 2014). The baseline datum point (0.20 RPM) utilized for PND during activity two was an outlier and likely resulted in a type II error.

PEM was the third and final method of statistical analysis used in this study. The calculation of PEM required the researcher to determine the median baseline datum point for each phase. After the median was calculated the number of overlapping data points in the intervention phase were counted. Then, the total number of overlapping scores were divided by the total number of observations. Through the use of the median baseline datum point, PEM prevents type II errors from occurring because while outliers are included in determining which datum point is the median point, they are not selected as the comparison point. PEM is subject to type I error, meaning the null was accepted when it should be rejected (Field, 2014). Based on the analysis of PEM each phase had an effect size of +1 (100%), which indicates that the intervention was highly effective. The outlier in the baseline phase of activity one was no longer an issue. Overall the data collected for this study in most instances indicated that the intervention was effective or highly effective as an intervention tool for preschool aged children with DD.

The data collection sheets provided space for the researchers to identify and write specific behaviors as they were observed. From the beginning of the observations during the baseline phase across all three activities through to the end of intervention, there were significant changes in Mason's behavior which impacted his overall fluidity, acceptance, and access to peers and desired toys or learning opportunities within the classroom. For example, during one of the initial observations, Mason was observed taking a seat from a

peer during activity two. This behavior resulted in Mason and the other child pushing one another. The peer yelled “Mason” and began to cry. On the same day during activity one, Mason took crackers another student was eating and in the process of taking the crackers, spilled the other child’s milk. During the next observation two peers, one who Mason requested several times during the visit to play with or sit next to and the other, a child Mason often was observed having conflict with, were playing with cars during activity three. Mason took the car from the peer that he was often observed having conflict with throughout the study; the peer got upset and took the car back, then Mason pushed the peer and took the toy back. The situation escalated to the point that the teacher intervened at which time Mason attempted to kick and hit the other child.

After the intervention began for activity one, Mason’s behavior during snack time significantly and immediately changed from having approximately one instance of behavior every minute ( $\bar{x} = 1.135$  RPM) to one instance of the target behavior occurring every eleven minutes ( $\bar{x} = 0.08$  RPM). On several days of intervention for activity one there were no observed instances of the target behavior. On these days Mason selected a seat, sat down, and was able to participate in different conversations such as a game of “knock-knock” jokes with his peers. During one observation of activity one, Mason took a napkin from a peer and the peer became upset, however, the peer had taken the napkin from Mason and Mason was taking it back. During another observation of activity one, Mason sat next to a peer and the peer had a bag of crackers. Mason asked the peer, “Can I open this?”. The peer responded “no.” and Mason asked him “why?” but did not disturb the bag of crackers. He and the peer proceeded to laugh and make silly faces together until they were finished with their snacks.

During the final week of observations Mason sat next to a peer and noticed that the peer was having a difficult time opening his snack. Mason looked at the peer and said “help?”, the peer responded “yes”, and Mason opened the snack for him. Prior to intervention, per the observations of Ms. McBride, Mason frequently took the snacks of his peers, their seats, or their snack materials (straws and napkins). Once intervention began, the target behavior became nearly extinct which provided Mason the opportunity to socialize and interact in a positive manner with his peers.

During the baseline phase of activity two Mason was observed initiating the target behavior approximately once every minute ( $\bar{X} = 0.77$  RPM). Once the intervention began for activity two the behaviors decreased to approximately once every five minutes ( $\bar{X} = 0.206$  RPM). Table time offered Mason and his peers the opportunity to learn through experiences that were pre-arranged on the tables in the classroom. Some of the learning experiences allowed for autonomy and were not teacher monitored whereas some of the learning experiences utilized direct instruction or were facilitated by a teacher. Mason exhibited the target behavior during both teacher-directed and autonomous learning experiences however, the frequency of the target behavior was generally higher when he had more autonomy.

One day, prior to intervention, Mason was pulling on the sweatshirt of a peer. During one observation Mason and a peer were using Magnetiles™ at the table without teacher support. As soon as he joined his peer Mason took some of the tiles that were used in the peer’s building. The peer began to cry, and Mason proceeded in taking additional tiles from the peer. During another instance when Legos were available at the non-teacher directed table Mason took Legos from the building of his peer. The peer



took the Legos™ back and Mason pushed and hit his peer as he took the Lego back from the other child.

After the intervention was implemented there was a significant decrease in the target behavior, however, it still occurred. Teachers utilized the small, portable flipscale version of the independent variable in order to prompt Mason to interact with his peers appropriately. There was one instance after intervention began where Mason and a peer were working at the table with the teacher on a coloring sheet relevant to the classroom lesson. Mason began to take crayons from his peer and a scuffle of pushing and pulling ensued. The teacher used the flipscale and prompted him by saying, “We’re working at a level two. Your friend has some and you have some.” After Mason was prompted his behaviors at that learning experience stopped. As the intervention continued for activity two the researchers observed Mason use appropriate communication to request items from his peers and engage with peers. For example, on one occasion while working at the non-teacher directed table Mason asked if he could play with Play-Doh™. On another occasion while working at the teacher directed table Mason stated “I need the red” in relation to needing a red crayon. During this same observation Mason was observed during the non-teacher directed experience stating to a peer, “I’m building a basketball hoop” as Mason and the peer used bristle blocks.

During one of the final observations Mason was observed using green Solo cups with two peers. On this occasion Mason did not have many cups. Rather than simply taking the cups from his peers, Mason asked one of the peers, “Can I have some (cups)?”. The peer gave him a stack of cups. Mason smiled, looked at the stack of cups she gave him and said “Wow!”. Mason then repeated the behavior with the second peer. The

second peer gave Mason a small stack of cups. Then, Mason and the two peers worked together to stack the cups.

On the final day of intervention and observation the researcher observed Mason participate in several behaviors that enabled him to participate, play, and engage with his peers. At one point, a peer took something from Mason; Mason looked at the peer and said, “I was using those”, the peer gave the items back to Mason. Another observation made this day was that Mason wanted to use a set of tongs that a peer was already using. As he reached for and touched the tongs Mason asked, “Can I play with these?”, the peer said “No.” and Mason let go of the tongs and got a different pair from the teacher. On this day one incident occurred where one of Mason’s peers got angry at another peer for taking her things. Mason heard them arguing and went over and took the items away from the peer that had taken the items away from the other child. Although Mason was making an attempt to help the victim in this situation, he was exhibiting target behaviors and data was collected accordingly. One final observation on this day was that during activity two, one of Mason’s peers dropped all of the items she was using. He went over and helped her to pick them up. Overall, the changes in Mason’s behaviors from the baseline phase through the intervention phase of activity two provided him the opportunity to interact in a more socially acceptable manner with his peers.

Finally, during activity three, center time, Mason exhibited target behaviors approximately once every minute ( $\bar{x} = 0.8$  RPM) throughout the baseline phase; this decreased to approximately one incident every six minutes during intervention. Center time allowed for the most autonomy of all the activities. During this activity children were able to go to any open learning center and stay there for as long as they liked.

Mason exhibited target behaviors frequently during activity three prior to intervention often had to be redirected or a teacher needed to intervene prior to the escalation of a situation involving Mason's target behaviors.

During one observation prior to intervention, Mason was observed hitting and kicking his peers. Almost daily, prior to the implementation of the intervention, Mason was observed taking away classmates' toys and kicking over the block buildings his peers created. One day, Mason looked at a child who was playing in the block center and then kicked over his tower. The boy yelled "MASON!" and Mason laughed and pretended like he was going to take the other child's blocks. During another observation Mason was observed stomping on a peer's toy, taking toys away from peers and running away with them, and writing on a drawing another peer was making.

On the first day of intervention for activity three, the teacher prompted him to be at a level three, meaning he was to work collaboratively with his peers. This included sharing toys and asking for items he wanted or needed. She prompted Mason by saying, "At a level 3 we..." and Mason responded, "play together.". Mason chose to participate in the dramatic play center. His peers were in the center pretending to make food and one of the children had a timer. Mason asked the child "Can I hear?" and the child put the timer to Mason's ear. During another observation the researcher saw Mason invite a peer to play with him. The peer accepted and Mason and the other child played together for twenty- five minutes with only one incident of the target behavior.

During the final observation and day of intervention the researcher observed Mason wait for five minutes in line to play a bowling game and participate in an individualized sensory bin. Four sensory bins were arranged on a table and there was one

child playing with each bin. Mason looked at and asked questions about the other children's bins but did not take their items. From the start of baseline to the end of intervention during activity three, Mason exhibited a decrease in the occurrence of the target behavior. His peers began inviting him to play and he began to participate in a more socially competent manner (asking peers if he can play with an item, helping to pick up things when they were dropped, and sharing items).

### **The Link Between the Use of the Empathizing-Systemizing Theory and Behavior Therapy**

In this study, the Incredible 5-Point Scale (Buron & Curtis, 2012), a teaching tool designed to modify target behaviors that address issues of social competency, was tested for its efficacy as an intervention in an inclusive classroom when designed for and implemented with a preschool aged child with developmental delays. The use of the Empathizing-Systemizing (ES) theory (Baron-Cohen, 2009) was utilized to determine the function of the target behavior and appropriate, developmental behavior expectations surrounding the target behavior. While appropriate expectations were determined for the target behavior, Behavior Therapy (BT; Antony & Roemer, 2011; Bothamley, 2002; and Spiegler, 2016). was utilized to develop how the intervention would be developed and implemented with and for Mason.

Although ES theory has its roots in ASD research there is distinct overlap between typical behavior development of preschool aged children and both the empathizing and systemizing attributes of ES Theory. For example, preschool aged children are developing the skill of empathy, in learning how their behaviors may make others feel as well as having an understanding of how others are feeling based on the

behaviors and expressions others exhibit (Dodge et al., 2008). When Mason took things from his peers he waited for their responses and then escalated the target behavior. On one occasion, Mason took a doll from another child. When the child reacted in an upset manner Mason ran away with the toy, resulting in the other child crying. Mason smiled through the interaction. Ms. McBride indicated that she felt these were attention seeking behaviors, therefore, it was determined that it was necessary to provide Mason with the opportunity to learn to understand how others were feeling (empathizing).

The implementation of the Incredible 5-Point Scale in the present study was designed to enable Mason to learn to identify how his peers may be feeling when he exhibited different types of inappropriate play with peers. Multiple methodologies were incorporated during this process. On the first day of intervention, the scale was explained to Mason. Within this explanation, his behaviors, according to the predetermined levels one through five, were identified and described to him through the use of examples and questioning to determine his understanding. In addition to teaching Mason about the different levels associated with his own behaviors the identified, peer specific emotions and behaviors were explained to Mason. To ensure Mason's understanding of the relationship between his behaviors and that of his peers within the scale, the different target level behaviors were reiterated by prompting Mason to provide examples of what his peers may look or sound like dependent upon the different level of target behaviors identified on the scale. The story was a useful tool to begin the day and remind Mason of the behavior expectations and what his peers may be feeling. The final method to teach Mason about the emotions and behaviors of his peers in response to his behaviors was the immediate and consistent prompting throughout the intervention phase across all three

activities. Prompting occurred at the beginning of the activity and then as needed throughout the activity. This is important, because like individuals with ASD, during the preschool years, information must be broken down into steps or tasks as children are developing the ability to follow a series of instructions and see the broader picture within a variety of contexts (Dodge et al., 2008). Therefore, interventions that utilize systemizing such as task analysis are frequently utilized in preschool settings.

In order to ensure that both empathizing and systemizing were being addressed as the present study was conducted the researcher chose to incorporate BT. While ES theory guided the “what” of the present study in regard to what behaviors would be addressed, BT addressed the “how” of the implementation of the study. BT was implemented by following Spiegler’s (2016) process of behavior therapy. The researcher worked with Ms. McBride to identify the problem; Mason’s target behavior was impacting the safety of all children in the classroom as well as Mason’s social relationships with other children in the classroom. Through a series of open-ended questions, the researcher and teacher determined that the goal of the intervention would be to decrease Mason’s target behaviors by teaching him to identify his own behaviors and what appropriate ways of interacting with his peers looks like as well as identifying the feelings of his peers under specific circumstances (empathizing) through the use of the 5-Point Scale (systemizing).

The next step in the implementation of BT was to determine what would stay the same and what would change throughout the study (Spiegler, 2016). In the present study, all aspects of the classroom schedule and rules remained consistent, and the only change made was the implementation of and frequent prompting to the Incredible 5-Point Scale.

In order to develop the treatment protocol for the intervention the researcher considered four primary resources, 1) the research guidelines set forth by CEC (2014) and WWC (2010), 2) the steps identified in Spiegler's (2016) BT process, 3) Buron and Curtis's (2012) recommendations for teaching and implementing the scale, and 4) what seemed to be feasible within the context of the classroom for both Ms. McBride and Mason.

Fidelity was maintained throughout the implementation of the scale and the intervention was implemented on a staggered schedule across activities. After each visit the data was analyzed and at the end of the intervention phase across all three activities final analysis was completed. Maintenance visits have been scheduled.

### **Social Validity**

The questionnaire provided to Ms. McBride indicated that she agreed that Mason's behavior improved, the intervention was effective, that she could accurately implement the scale in her classroom, and the time required to implement the scale was reasonable. She strongly agreed that the changes she observed in her student were socially important, she understood the intervention steps for the Incredible 5-Point Scale, the scale was easily incorporated into her classroom, and that she had the necessary materials to implement the scale.

Throughout the present study the researcher communicated verbally, via text, and through email with Ms. McBride. The additional opportunities for the researcher to engage with the teacher provided information regarding the teacher's feelings and opinions of the scale as this study was conducted. One comment Ms. McBride made during one of the conversations she and the researcher were having was that if someone had asked her at the beginning of the study if implementing a little scale would have an

impact on her student's behavior, she would have told them not a chance. However, after working with the scale and seeing the results she was excited and surprised by the effectiveness of the scale. The TA was standing next to Ms. McBride and said that she agreed, she was also surprised by the results of the intervention (Ms. McBride & TA, personal communication, November 30, 2018).

### **Limitations**

Clear definitions of the participant and setting, procedural fidelity checks, and social validity checks support the validity of the present study (See Figure 22). The use of IOA ensured the reliability of the data collected. However, all studies have limitations that should be addressed by the researcher. The limitations for the present study are related to the data collection, IOA, and researcher created intervention and will be discussed.

First, there were some limitations in the data collection. During activity one, only two baseline probes were gathered. WWC and CEC recommend that a minimum of three baseline probes be collected as one criterion for a study to be recommended without reservations (CEC, 2014; Kratochwill, 2010). However, if there is concern for the safety of the participant or other individuals in the environment both WWC and CEC permit less than three baseline probes to be collected (CEC, 2014; Kratochwill, 2010). In the current study, *Mason's* behaviors were potentially harmful to himself and his peers, therefore, the collection of two rather than three baseline data probes for the first activity was appropriate. Although, during activity one Mason's baseline data indicated a decreasing trend in the target behavior, prior conversations with the teacher provided evidence for an a priori assumption that the target behavior would have some variability



and would increase again. On days snacks were small such as goldfish crackers or animal crackers Mason's incidence of target behavior would be higher than days where the students were offered muffins. Due to the dangerous nature of his target behaviors during snack and the potential risk of injury (such as a child falling off of a chair or spilling a drink) it was determined to begin intervention after the second data probe.

**Figure 22. The Control for Internal, External, and Social Validity in the Present Study**

<b>How the Present Study Controlled for Internal Validity</b>	<b>How the Present Study Controlled for External Validity</b>	<b>How the Present Study Controlled for Social Validity</b>
History: Mason did not have prior experience with the Incredible 5- Point Scale.	Staggered implementation of the intervention across three activities.	Subjective evaluation was used to identify the participant(s) for the study.
Maturation: The data collection window was short (26 days) therefore reducing the likelihood of maturation.	Detailed description of the participant (Mason) was provided.	Questionnaire which was completed by Ms. McBride at the end of the study.
Testing: Observations with Mason were unobtrusive, the researchers maintained appropriate distance throughout the data collection periods.	Clear and observable definition of the target behavior, inappropriate play with peers, and its levels were provided.	Personal communication with Ms. McBride and her TA throughout the study.
Instrumentation: The instrument remained the same throughout the data collection process.	Detailed description of the setting was provided.	
Statistical regression: The use of a multiple-probe design and the staggered implementation of the intervention across activities prevented statistical regression.	Attrition: Three separate but similar studies were started. Mason's study came to fruition and was completed from beginning to end.	
Selection Biases: Mason was selected through by his teaching using subjective evaluation.		
Attrition: In order to ensure a study was completed, the researcher began with three studies and five participants. Mason's study was conducted from start to finish.		
Diffusion of Treatment: This design does not remove treatment as a means for assessment, therefore this threat to internal validity can be ruled out.		

There was some variability in the baseline data for activity two. According to Kazdin (2011), one source of data variability can come from uncontrolled changes in the setting (p. 41). The first baseline datum point was an outlier compared to the other two

baseline data points. This can be explained through setting variability; usually, during table toy activities there are three tables set up for students to participate in some learning experience. One table uses direct instruction, the second table either has a learning experience which provides complete autonomy to students or the TA facilitates the experience, and the third table offers a learning experience with complete autonomy such as Legos or bristle blocks. On the first day of baseline data collection there were two table toy activities planned, both were individualized, and teacher directed. Therefore, Mason had limited autonomy and opportunity to interact with his peers. This variability may have caused a type II error when PND was calculated.

The use of frequency ratio to determine IOA is a second limitation to the present study. Frequency ratio poses a limitation because there is no way to know if the observers were agreeing on the same instances of behavior throughout the observation. For example, if the first and second researchers each recorded three instances of the target behavior, there is a possibility that the researchers were not recording the same instances of behaviors, rather each saw different instances of the target behavior. One way of avoiding this is by having a clear definition of the target behavior. Prior to beginning the data collection process, the researcher worked with Ms. McBride to develop a clear definition of the target behavior and descriptions of observable behaviors. The clear description enabled observers to identify whether or not the behaviors Mason was exhibiting were target behaviors. This information was then shared with the second researcher. A second method to reduce limitations posed by the use of frequency ratio for IOA is conversation regarding the data collection during and after observations. Throughout the data collection when both researchers were present, they discussed the

data they gathered and any possible discrepancies in between their data; for example, if one researcher or the other noticed when a behavior was identified that the other researcher did not see, the two researchers would discuss the discrepancy.

A third limitation in the present study was the use of researcher created intervention tools. After speaking with the teacher, the researcher developed the scale and story to be implemented throughout this study. While this provided the researcher with more control over how the information was presented, it limited the teacher's ability to learn and experience the process of the development of an Incredible 5-Point Scale. In her response to the questionnaire, Ms. McBride made reference to her uncertainty of being able to develop a scale independently. This can be alleviated through additional training and support for the teacher. Furthermore, as the expert and more knowledgeable other regarding Mason, Ms. McBride may have been able to develop a scale that utilized more familiar language and concepts that were of higher interest to Mason.

### **Implications**

**Teachers.** The results from this study are indicative that the tool may be a practical and effective intervention for preschool aged children with DD. In the final questionnaire, at the end of the study, Ms. McBride, reported that the scale was easy to implement and did not take away from or distract the other students in the classroom, she also reported that the scale was cost effective and easy to develop. Ms. McBride and her TA followed the treatment protocol and implemented the scale consistently. Without the consistency and overall fidelity of the treatment protocol the intervention may not have had as high of a success rate. It is critical that the teachers in the classroom follow the treatment protocol and maintain consistency with the implementation of the scale.

It is important to note that at this time, the Incredible 5-Point Scale itself is not considered an EBP and while teachers could incorporate this intervention in their classrooms, it cannot be used as an official intervention on a child's IEP or behavior management plan per the requirements of IDEIA (2004) and ESSA (2015). However, there are techniques used in the teaching and implementation of the scale that are EBP (social stories, modeling, video modeling, prompting) which may be incorporated into IEPs and behavior management plans.

The researcher stresses the importance of the individualization of the tool. In the present study Mason's love for superheroes was incorporated in the development of all the intervention tools. As the tools were introduced to Mason, he began to associate the characters on the scales and in the story to himself and his peers. The scale became relevant to him because he was able to identify with the scale and referred to himself as *Super Mason*. According to Buron and Curtis (2012), incorporating the child's interests encourages increased engagement and acceptance of the scale (Buron & Curtis, 2012).

Teachers considering the use of the Incredible 5-Point Scale in their classrooms need to first clearly define a target behavior by identifying observable characteristics of the behavior. Using a functional behavior assessment or some other type of anecdotal record over time to observe and document the behaviors is essential to the identification of the target behavior and determining the motivation behind the target behavior. Teachers should then determine what behavior the student should be exhibiting and clearly define and identify observable behaviors of the desired behavior.

In the present study, the researcher determined that the success of the intervention was due in part to Mason's ability to relate to the scale as well as the consistency of the

implementation of the scale. With that being said, teachers need to either develop the scale with the student or fully consider the student's interests as the scale is created. Whenever possible Buron and Curtis (2009) recommend the participation of the individual receiving the intervention in the development of the scale. However, if the student does not assist in the creation of the scale the teacher can determine the student's interests through the observation of regular activities and conversations in which the child participates. Additionally, the teacher can send home a survey or questionnaire regarding the student's likes or dislikes.

After the teacher has identified the target behavior(s), desired behavior(s), and student interests, he or she should consider the classroom schedule, overall student needs and demands, as well as the learning style of the student receiving the intervention to determine which techniques and tools (i.e. social narratives, flipscale, large scale, prompting, etc.) are most feasible for the setting where the intervention will take place and which methods the child will respond to most positively. In the present study, Mason responded extremely well to the use of a social narrative both in print and electronic versions to help him process and learn the components of the scale and to define the specific behaviors addressed on the scale. The use of the small flipscale was also beneficial as it was easy to carry from one place in the classroom to another. There are many free online resources that can be used to aid in the development of the scale, videos, or social narratives. For the present study, the researcher used ClipArt characters and a free online program, Canva™ to develop the illustrations for the story. After the illustrations were completed the researcher used Adobe Spark™ (also a free online

resource) to create the story pages and voiceover. The story was then uploaded to YouTube™ so that it would be easily accessible to the teacher.

Once the scale has been created the teacher should teach the scale to any adults who will also be utilizing the scale with the student. This ensures consistency throughout the implementation of the intervention. After the adults have been trained on the scale's use and provided specific definitions and descriptions of the observable target and desired behaviors the teacher will be ready to implement the scale with the student. It is critical that the teacher takes the time to thoroughly teach the scale to the student receiving the intervention to ensure he or she has a full understanding of the target behaviors and the teacher's expectations of the student's behaviors. The scale must be implemented consistently, and the student should be prompted with the scale as often as needed.

Buron and Curtis (2012) note the ease of the scale's use between home and school. When taught and implemented with fidelity and consistency the scale can easily transfer between the home and school. Successful implementation in the school and home environments could create an opportunity for open communication between teachers and families regarding student behavior. It also provides children with additional behavioral support and consistent expectations at home and school. Implementing a study to confirm this would be an important piece of the literature regarding the scale.

Finally, throughout the process (pre-intervention through intervention) the teacher should have some way to document the student's behaviors. The documentation will provide data to determine whether or not the intervention is working. Additionally, the teacher will see patterns in the student's behaviors across different activities or settings and times throughout the day, across activities, and across observations. The researcher

developed a data collection tool that enabled her to identify the frequency of the behaviors during specific activities throughout Mason's day. She included a column to write the time of each observation across activities and a place to write anecdotal observations throughout the data collection period. The tool that was created was one page so that the researchers did not have to flip through pages during the observations. This ensured that all of the data collected in a visit was maintained on one document and reduced the possibility of losing portions of the data.

**Future Research.** Buron and Curtis (2012) originally developed the Incredible 5-Point Scale to be used with individuals with ASD. The present study focused on a preschool aged child with DD. An extensive literature review did not reveal any published, peer reviewed studies on the Incredible 5-Point Scale to the researchers. Due to the popularity of the tool and the absence of empirical research, there is an impetus for significant research opportunities to determine the tool's effectiveness for individuals across the lifespan and across a variety of disabilities and settings (classroom, therapeutic, and home). Furthermore, to address the present study's limitations, and to increase the methodological rigor, it is recommended that future researchers improve IOA procedures, observe stable data across all baselines, and encourage teacher made intervention tools.

For individuals interested in early childhood education, specifically preschool, future research should focus on determining the tool's efficacy for preschool aged children who are typically developing and who have a wide range of disabilities. A natural progression would be to complete a series of multiple-baseline or multiple probe design studies across participants in which one study focuses on typically developing

students, one study focuses on students with DD, and one study focuses on children with ASD. These studies would be indicative of the efficacy of the scale for children with different exceptionalities. After the completion of these three separate studies an additional multiple-baseline or multiple probe design study across participants in which there is a participant who is typically developing, a participant with DD, and a participant with ASD should be conducted. During this study the researcher(s) could determine the scale's efficacy across participants and exceptionalities as well as its effectiveness for different skills and behaviors. The present study focused on Mason's inappropriate play with peers, however a future study could focus on shyness or a child's indiscretion when speaking with strangers. Additional research in ECE environments could include whole group use of the scale. For example, a study could be completed to determine if the scale could be utilized to help groups of students regulate the classroom noise volume.

For individuals interested in elementary, middle, or high school students, studies could be completed with participants of varying disabilities. In their book, Buron and Curtis (2012) have indicated the use of the Incredible 5-Point Scale across a variety of classroom settings from elementary to high school. They have also found that students with disabilities other than ASD such as obsessive-compulsive disorder and anxiety disorders have reacted well to the interventions. If research can provide support for the scale's use across the lifespan its use could be limitless as it could provide a familiar support from early childhood through adulthood. This demonstrates the need for future research across ages.

## **Conclusion**



This study was an initial empirical attempt to shed light on the effectiveness of the Incredible 5-Point Scale. Although, the scale uses several EBP throughout its development, implementation, and intervention, there is no published research on the scale and it has not been determined to be an EBP. Moreover, results from this study are promising and build the foundation for future research. The present study may enable stakeholders to make decisions regarding the effectiveness of the scale through the evidence it provides.

This study focused on a preschool aged child with DD. In almost all analysis the scale was considered to be effective or highly effective for decreasing the RPM of a well-defined target behavior across three separate activities. Although one activity, activity two, was considered ineffective when PND was calculated the same activity had an effect size of +1 when calculated using PEM. This discrepancy in data indicated that there may have been a type I or type II error in the data analysis. After conducting visual analysis and considering the baseline data, it was determined that a type II error was more likely due to the significant outlier recorded in the baseline data phase.

Results from this study have implications for future research on the tool as well as the use of the tool in preschool classrooms. Several research ideas have been proposed as follow-up studies to this work. The present study utilized the Incredible 5-Point Scale as an intervention, however, known EBPs were utilized to teach the scale to the participant and regular prompting of the scale was necessary for its success. As professionals continue to advance the literature regarding evidence-based practices it is important to take note of the relationship between old and new; new methods are important and provide more opportunities for individuals to learn and grow, meanwhile, old, tried and true methodologies have proven effective and should not be placed on the shelf for the sole purpose of only trying the new methodologies. There needs to be a balance and sometimes a marriage between what the old and new methodologies have to offer to students, teachers, and families alike. As professionals in the field it is necessary to embrace both

and incorporate them into the work done in the classroom. Lastly, educators reading this work will have an indication of the potential of the tool and be able to make a decision as to whether or not they could implement it in their classrooms and if they believe the tool will be effective.

## Appendices

### Appendix A. Rhode Island College Institutional Review Board Approval

**LaCava, Paul G.**

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**From:** NoReplyRIC\_Elements@topazti.net  
**Sent:** Monday, May 28, 2018 4:20 PM  
**To:** Institutional Review Board - Rhode Island College; LaCava, Paul G.; Pinheiro, Beth M.  
**Subject:** IRB: #1718-1527 (La Cava, Paul) approved

Greetings,

The proposal for the project referenced below has been APPROVED by the Institutional Review Board (IRB).

Project title: Exploring the Incredible 5-point Scale: Impact on Target Behaviors in Preschool

Approval #: 1718-1527  
Type of review: Expedited  
Proposal type: Original  
Principle Investigator: La Cava, Paul  
Fees received: 1. No fees -- RIC supervised or sponsored Funding status:

Approval date: 5/28/2018  
Expiration date: 5/28/2019  
A request to renew this protocol must be received by 4/30/2019.

Click here to access the protocol:  
<https://ric.topazti.net/RIC/SL/Default.aspx?linkParms=NPqkQNfZcnV%2b0mTwhvcVcQ%3d%3d>

Your responsibilities as the Principal Investigator on this project are as follows:

1. You may implement only those materials and methods approved by the IRB. Changes to the protocol topic or methods, including the elimination of previously-approved methods, require prior approval.
2. If you are using signed consent materials, a PDF of the form(s) with the approval stamp will be uploaded to your protocol. You must use this copy with participants.
3. Unanticipated problems or adverse events must be reported within three (3) days of your knowledge of the event.
4. If you wish to continue the project beyond the expiration date, you must complete and submit a progress/final report within 30-days prior to the expiration date. If approval to continue the project is not finalized by the expiration date, you must discontinue all work pertaining to this protocol and wait until approval is given before resuming data collection.
5. You must keep all research data and consent documents within your possession in a secured location for at least three (3) years after the completion of the study, including publications or presentations of any reports.

Do not reply to this "RIC\_Elements" email address because it will not be received by the IRB. Send all correspondence to IRB@ric.edu.

Best Regards,

## Appendix B: Consent for Participation

### ***PERMISSION DOCUMENT*** **Rhode Island College**

#### Exploring the Incredible 5-point Scale: Impact on Target Behaviors in Preschool

#### ***Dear parent or legal guardian:***









We are asking permission for your child, or the child in your legal care, to be in a research study. We are asking because your child is preschool aged and has an identified target behavior which fits the use of the Incredible 5-Point Scale. Please read this document and ask any questions you may have before deciding whether to permit your child to be in this study.

Beth Pinheiro, a doctoral candidate at Rhode Island College, is conducting this study.

Paul LaCava, an Associate Professor at Rhode Island College, is the principal investigator for this study.

#### **Why this Study is Being Done (Purpose)**

We are doing this study to learn about the effectiveness of The Incredible 5-Point Scale. A sample of the scale can be seen below:

An incredible 5-Point Scale designed for a preschool aged child with 5 points			A modified incredible 5-Point Scale designed for a preschool aged child with 3 points		
5	I am yelling and this is too loud!		3	I am using an outside voice, I may be too loud!	
4	I am using an outside voice.				
3	I am using my normal talking voice.		2	I am using a talking voice.	
2	I am whispering or using a quiet voice.				
1	I am not talking.		1	I am whispering or using a quiet voice.	

Pinheiro©, 2018

#### **What will be done (Procedures)**

If you choose to have your child participate in this research, you will be asked to do the following things:

- **Allow** your child to be observed and his/her behaviors to be documented for approximately 12-16 weeks, 2-3 days a week for 1-2 hours during the 2018-2019 school year.
- **Answer** some questions about your child. (i.e. Has your child used the Incredible 5-Point Scale before? Does your child have an identified disability? If yes, when did your child receive his/her diagnosis?)
- **Your** child's behaviors will be observed.
- **A scale** will be created specifically for your child and with help from your child's teacher, your child will use the scale.
- **During** your child's use of the scale, his/her behaviors will be observed.
- **At the end** of the study, if you wish, there will be a training on the scale and explanation of how you can implement it in your home.

### **You Will Not Be Paid**

You will not be paid for this study. However, at the end of the study, you will receive a book about The Incredible 5-Point Scale and have the opportunity to participate in a training to learn about the implementation of the scale at home.

### **Risks or discomfort**

The risks of this study are minimal, meaning they are about the same as what your child would experience during everyday activities. Your child can be removed from the study at any time. Removal from the study will not affect you or your child, the tool will be removed from use with your child.

The scale will be shared with your child and your child will be aided with its use and implementation. Any questions your child has regarding the scale will be answered.

### **Benefits of being in the study**

Being in this study will not benefit you or your child directly. However, you will have the opportunity to learn about a behavior intervention that can be implemented both in the home and school. Furthermore, your child's participation will help us to determine the effectiveness of the scale with other preschool aged children.

### **Deciding whether to be in the study**

Nobody can force your child to be in this study. The decision is up to you. You can choose not to be in the study, and nobody will hold it against you. You can change your mind and stop the study at any time, and you do not have to give a reason. If you decide to quit later, nobody will hold it against you.

### **How your information will be protected**

Because this is a research study, results will be summarized across all participants and shared in reports that we publish and presentations that we give. Your child's name will not be used in any reports. We will take several steps to protect your child's information so that he/she cannot be identified. Instead of using your child's name, the information will be given a code number. The information will be kept in a locked office file, and seen only by myself and other researchers who work with me. The only time I would

have to share information from the study is if it is subpoenaed by a court, or if we think your child is being harmed by others then I would have to report it to the appropriate authorities. Also, if there are problems with the study, the records may be viewed by the Rhode Island College review board responsible for protecting the rights and safety of people who participate in research. The information will be kept for a minimum of three years after the study is over, after which it will be destroyed.

#### Contacts and Questions

You can ask any questions you have now. If you have any questions later, you may contact Beth Pinheiro at 401.456.8599 or [bpinheiro@ric.edu](mailto:bpinheiro@ric.edu). You may also contact Dr. Paul LaCava with any questions or concerns at [placava@ric.edu](mailto:placava@ric.edu).

If you think you were treated unfairly, have complaints, or would like to talk to someone other than the researcher about your rights or safety as a research participant, please contact Cindy Padula, Chair of the Rhode Island College Institutional Review Board at [IRB@ric.edu](mailto:IRB@ric.edu), or by phone at 401-456-9720.

You will be given a copy of this form to keep.

#### **Permission Statement**

By signing below I/we are stating that I/we understand the information and give permission for my/our child to be in this study. Both parents/guardians must give their permission unless one parent is deceased, unknown, incompetent, or not reasonably available, or when only one parent has legal responsibility for the care and custody of the child. I/we are over 18 years of age, and either the parent or legal guardian of the child named below.

Child's name:

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1. 

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---

Print name  
Date

Signature

2. 

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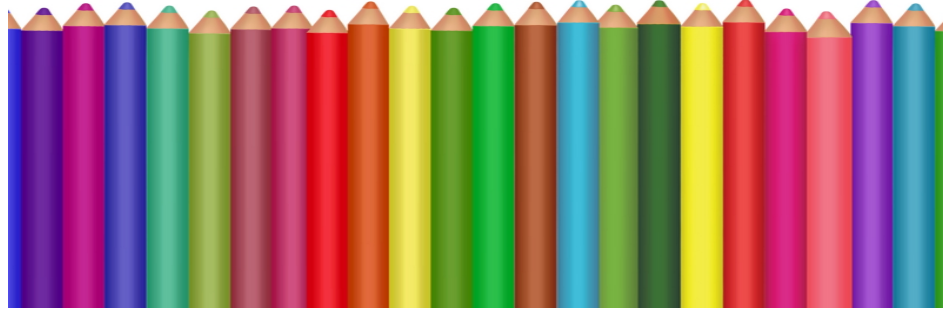
Print name  
Date

Signature

Name of researcher obtaining permission:

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## Study of the Effectiveness of the Incredible 5-Point Scale with Preschool-Aged Children



### **Do you work in a preschool classroom?**

My name is Beth Pinheiro. I am a doctoral student in the joint Ph.D. program through Rhode Island College and The University of Rhode Island. I am looking to study the effectiveness of a classroom management and social and emotional teaching tool, the Incredible 5-Point Scale. The study will focus on modifying targeted behaviors of preschool-aged children. I am completing this study as part of my dissertation under the supervision of Dr. Paul LaCava.

### **Would you like to be a part of this study?**

*If you say yes, what will you need to do?*

- You will identify target behaviors you would like to see addressed in some of your students.
- You will send home a recruitment flier to the families of children you have identified.
- Once families indicate to you that they are interested in the study, you will send home a consent form to be signed.
- You will be trained on the development and implementation of the Incredible 5-Point Scale.
- Your classroom and students will be observed during the 2018-2019 school year.
- You will have a discussion at the end of the study regarding your opinions on the use of the scale.

## Appendix C: Recruitment Letter to Teachers, Continued

### Study of the Effectiveness of the Incredible 5-Point Scale with Preschool-Aged Children



#### What will happen to the collected information?

Information gathered from this study will never be connected to you or your students' names. The researcher will observe your students' behaviors before and during the use of the scale. The record from this research will be kept private. In any published documents following the study no information will be included that will make it possible to identify you or your students.

#### Sample Scale

An incredible 5-Point Scale designed for a preschool aged child with 5 points			A modified incredible 5-Point Scale designed for a preschool aged child with 3 points		
5	I am yelling and this is too loud!		3	I am using an outside voice, I may be too loud!	
4	I am using an outside voice.				
3	I am using my normal talking voice.		2	I am using a talking voice.	
2	I am whispering or using a quiet voice.				
1	I am not talking.		1	I am whispering or using a quiet voice.	

Pinheiro©, 2018

#### Contact

If you would like more information or have any questions or concern, please do not hesitate to contact Beth Pinheiro at [bpinheiro@ric.edu](mailto:bpinheiro@ric.edu). This research will be conducted under the direction of the principal investigator for the study, Dr. LaCava ([placava@ric.edu](mailto:placava@ric.edu)) from Rhode Island College.



## Study of the Effectiveness of the Incredible 5-Point Scale with Preschool-Aged Children



### **Do you have a child in preschool?**

My name is Beth Pinheiro. I am a doctoral student in the joint Ph.D. program through Rhode Island College and The University of Rhode Island. I am looking to study the effectiveness of a teaching tool called the Incredible 5-Point Scale with preschool-aged children. Classroom teachers will be using the Incredible 5-Point Scale in order to help children learn new skills and/ or change behavior. I am completing this study as part of my dissertation under the supervision of Dr. Paul LaCava.

### **Would you like your child to be a part of this study?**

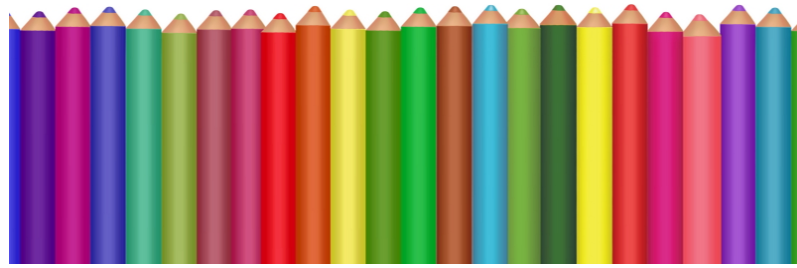
*If you say yes, what will you need to do?*

- Give consent for your child to be observed during his/her school day during the 2018-2019 school year.
- Give consent for your child to participate in the use of the Incredible 5-Point Scale.
- Answer a few questions about your child.

### **What will happen to the collected information?**

Information gathered about your child will never be connected to you or your child's name. The researcher will observe your child's behaviors before and during the use of the scale. The record from this research will be kept private. In any published documents following the study no information will be included that will make it possible to identify you or your child.

## Appendix D. Recruitment Letter to Parents, Continued



### Sample Scale

An incredible 5-Point Scale designed for a preschool aged child with 5 points			A modified incredible 5-Point Scale designed for a preschool aged child with 3 points		
5	I am yelling and this is too loud!		3	I am using an outside voice. I may be too loud!	
4	I am using an outside voice.				
3	I am using my normal talking voice.		2	I am using a talking voice.	
2	I am whispering or using a quiet voice.				
1	I am not talking.		1	I am whispering or using a quiet voice.	

Pinheiro©, 2018

### Contact

If you would like more information or have any questions or concern, please do not hesitate to contact Beth Pinheiro at [bpinheiro@ric.edu](mailto:bpinheiro@ric.edu). This research will be conducted under the direction of the principal investigator for the study, Dr. LaCava ([placava@ric.edu](mailto:placava@ric.edu)) from Rhode Island College.

**Please check one and return to your child's teacher.**

\_\_\_ **Yes**, I would like more information about participating in this study.

\_\_\_ **No**, I am not interested in participating in this study.

---

Parent Signature

## Appendix E. Schedule and Activities for the Present Study

Week: Month	Activity
1: Oct./Nov.	Consent forms signed and received
1: Nov.	<p><b>Observation One:</b> All participants were present Baseline data collection began across all activities IOA</p> <p><b>Observation Two:</b> Baseline data gathered for activity one Discussion between researchers regarding target behaviors of each participant: determined to end study for P1, P2, P3, &amp; P4 Teacher discussed change in circle time routine IOA activity one and three</p>
2: Nov.	<p>No observations</p> <p>Mason intervention began activity one</p>
3: Nov.	<p><b>Observation Three:</b> 5<sup>th</sup> day of intervention activity one Fidelity check</p> <p><b>Observation Four:</b> 7<sup>th</sup> day of intervention activity one Fidelity check Baseline phase across activities two and three IOA</p>
4: Nov./Dec.	<p><b>Observation Five:</b> Day 10 intervention activity one Fidelity Check Baseline across activities two and three</p> <p><b>Observation Six:</b> Day 11 intervention activity one Day one intervention activity two Fidelity Check Baseline activity three IOA</p>

Appendix E. Schedule and Activities for the Present Study, Continued

Week: Month	Activity
5: Dec.	<p><b>Observation Seven:</b>  Day 13 intervention activity one  Day three intervention activity two  Fidelity Check  Baseline activity three</p> <p><b>Observation Eight:</b>  Day 15 intervention activity one  Day five intervention activity two  Fidelity Check  Baseline activity three</p> <p><b>Observation Nine:</b>  Day 16 intervention activity one  Day six intervention activity two  Fidelity Check  Baseline activity three  IOA</p>
6: Dec.	<p><b>Observation 10:</b>  Day 20 intervention activity one  Day 10 intervention activity two  Day one intervention activity three  Fidelity Check  IOA</p> <p><b>Observation 11:</b>  Day 21 intervention activity one  Day 11 intervention activity two  Day two intervention activity three  Fidelity Check</p>

Appendix E. Schedule and Activities for the Present Study, Continued

Week: Month	Activity
7: Dec.	<p><b>Observation 12:</b>  Day 22 intervention activity one  Day 12 intervention activity two  Day three intervention activity three  Fidelity Check</p> <p><b>Observation 13:</b>  Day 23 intervention phase one  Day 13 intervention phase two  Day four intervention phase three  Fidelity Check</p> <p><b>Observation 14:</b>  Day 24 intervention activity one  Day 14 intervention activity two  Day five intervention activity three  Fidelity Check  IOA</p> <p><b>Observation 15:</b>  Day 25 intervention activity one  Day 15 intervention activity two  Day six intervention activity three  Fidelity Check</p>

## Appendix F. End of Study Teacher Questionnaire

### Social Validity Assessment (Educator)

ID#: S1T1      Date: 01/04/2019 Respondent: Teacher

Use the following scale to answer how much you agree or disagree with the following 8 statements. Circle the answer that you most agree with for each statement. Add any further comments in the space provided. Then answer the following four questions. Thank you!

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1. Over the course of the study my student improved on the target behavior.

Strongly agree	<input checked="" type="radio"/> Agree	Neither agree nor disagree	Disagree	Strongly disagree
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2. The changes in my student that I observed were socially important.

<input checked="" type="radio"/> Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
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3. The 5 Point Scale intervention was effective.

Strongly agree	<input checked="" type="radio"/> Agree	Neither agree nor disagree	Disagree	Strongly disagree
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4. I understand the 5 Point Scale intervention steps.

<input checked="" type="radio"/> Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
--	-------	-------------------------------	----------	----------------------

5. The 5 Point Scale intervention is easily incorporated into my classroom routines.

<input checked="" type="radio"/> Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
--	-------	-------------------------------	----------	----------------------

6. I believe that I can accurately implement 5 Point Scale in my classroom.

Strongly agree	<input checked="" type="radio"/> Agree	Neither agree nor disagree	Disagree	Strongly disagree
-------------------	--	-------------------------------	----------	----------------------

7. I have the necessary materials to implement 5 Point Scale accurately.

<input checked="" type="radio"/> Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
--	-------	-------------------------------	----------	----------------------

## Appendix F. End of Study Teacher Questionnaire, Continued

8. The time required to use 5 Point Scale is reasonable.

Strongly  
agree

Agree

Neither agree  
nor disagree

Disagree

Strongly  
disagree

9. What are your thoughts and opinions about the purposes of this research study?

This research study was very helpful within my classroom, it not only helped change the behavior of one of our students but having the research team in the classroom helped us ensure we were using the scale correctly and with consistency. The scale is a valuable tool that can be used within multiple age and development levels.

10. Do you feel that the 5 Point Scale intervention is/will be a cost effective intervention to use with your students? Why or why not?

Yes, it takes minimal effort and resources to create the visual scale and video for the students. The set up is easy enough to make all scales individual per student and include visual supports that match their interests.

11. Do you feel that the 5 Point Scale intervention is/will be an easy to use intervention to use with your students? Why or why not?

The scale and procedures were clearly explained and easy to use and understand. The use of visuals assisted in the ease of the procedure and was matched to the interest of our student. The video was an excellent addition to the printed scales and made using the intervention easy. We were able to set up the student on the computer to watch the video while we were working with other students, and then check in once the video was finished. The small visuals made it easy to check in before each activity and to hold up as reminders if needed. The student was able to understand the scale easily and followed along with ease.

12. Any other overall comments that you would like to share about this research, the research team, your student, the study methods, the 5 Point Scale intervention, etc.?

The research team was amazing within our classroom; they answered all of our questions and made sure to include all adults within our room. They interacted with all of the students in our classroom when they weren't observing and became part of our classroom. They did a fantastic job observing and taking data on our student without him or any of the other children realizing that they were being observed. This helped our classroom continue to run smoothly and make the whole process wonderful. It was helpful to work with the research team to come up with the scale and to determine which behavior to focus on. Having someone to help with the beginning steps of developing the scale was helpful and made developing the scale easy. I might have some difficulty developing the scale on my own, but with practice I believe I will be able to create multiple scales for various behaviors.

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